American Foundryman

A PUBLICATION PRESENTING ASSOCIATION AND CHAPTER ACTIVITIES

ATIONAL
OUNDRY
WEEK
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CHICAGO
May
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Past President Wick, Chairman of Membership Committee, Urges Cooperation. See Inside Front Cover — Special Events of Convention, See Page 2 — Final Program for 44th Annual Convention, See Page 5 — Regional Conferences, See Page 10.

May
1940

Membership In the Association An Opportunity

TO THE FOUNDRYMEN OF AMERICA

Very few of you who attend this the 44th Annual Convention and Foundry and Allied Industries Show of the American Foundrymen's Association have anything like an adequate realization of what the necessity of maintaining and increasing the membership support means to all of us.

You are challenged to think about the existence of the American Foundrymen's Association and its mission in your economic situation.

You are forced to consider how effectively it is fulfilling its purpose and the part you as an individual are assuming. You cannot resist the compulsion to look into the future and wonder a bit about the shape of things to come. Just what are you contributing to A.F.A.?

As these and similar ideas have passed through my mind the past few weeks, I have discovered myself looking back to those persons and situations which induced me to recognize my responsibility to support A.F.A. and to make provision to continue to do so.

Others may fail to see it, but I know those persons who made A.F.A. possible have added a dimension to my life, my business and have greatly increased my joy of living.

Very early in my A.F.A. membership life I received a questionnaire from our national office. I was deeply interested in its subject matter. I answered it and immediately the door of opportunity opened. I was given the privilege of meeting a group of keen, alert, successful leaders in my own business, and asked to co-operate with them in working on a problem common to our industry.

Looking back through twenty years, I am persuaded that it was one of the finest things I have ever done, not for A.F.A. but for myself.

I discovered that along with the joy and excitement of adding my bit to the judgment and experience of others, benefits never dreamed of, have returned to me.

I know that many who read these words have made the same discovery and in a larger measure than I have. Nevertheless, I write to you who have not, and urge that you Put Yourself into the Process.

You start with a membership.

Any one of the "Committee of 100" (you will find one close at hand at the convention), is eager to accept your applications.

Sincerely yours,

JAME L. WICK, JR.

Past President, American Foundrymen's Association, President Falcon Bronze Company, and Chairman A.F.A. Membership Committee.

American Foundryman

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May, 1940

Volume 2 — Number 5

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Final Call—1940 Foundry Week—Chicago—May 4 to 10

ALL plans are now set for what promises to be one of the greatest foundry shows and conventions ever held by the Association. Attendance records are most surely to be broken. The program committees have prepared a schedule of papers, covering all phases of the industry which should prove of particular interest to executives, engineers, operating men and shop men. The three large halls of the International Amphitheatre, 42nd and South Halsted Sts., Chicago, will be filled with the latest in displays of foundry and allied equipment and supplies. Plant executives have found that not only they can benefit by a study of these displays but that through having their staff members examine the exhibits in detail, the greatest good can be returned to their companies. Many executives have prepared schedules of exhibits, on which their staff report, a procedure recommended to all firms.

Show Preview Day

Beginning at 1:00 P. M. Saturday, May 4, the Foundry Show will be kept open until 10:00 P. M. that evening for a Preview, with admittance by Preview Day passes available through the A.F.A. office to all foundries and others interested. As most foundries do not operate on Saturdays, an attendance of several thousand is expected for the Preview, as this will afford management an excellent opportunity to have their employees see the foundry industry on parade.

Registration

The main registration for those attending the convention and show will be at the north entrance to the International Amphitheatre. Members have been furnished with registration credential cards, for themselves and their ladies.

Registration for the ladies will be in Room 11 at the Palmer House, downtown Chicago.

These registration credential cards when presented at the registration desks will permit of registration without payment of the fees required of non-members. These cards will facilitate registration as membership will not have to be checked by the clerks.

Hotel Headquarters

The Palmer House has been designated as the downtown convention headquarters. Evening sessions and such special events as the annual dinner, business meeting, smoker, etc., will be held there.

Transportation to Exhibition Hall

While the Amphitheatre, where the Foundry Show will be held, has good transportation facilities from downtown Chicago, by means of elevated service and taxis, the Association has arranged for special bus service from the Palmer House to the Convention Hall and return.

Convention Sessions

The complete schedule of the convention technical sessions, round table meetings and special events is given on pages 5 to 8 and 18 of this issue.

Daylight Saving Time

The attention of out-of-town members attending the convention is called to the fact that the times listed on the schedule are "daylight savings" times which is one hour ahead of Central Standard or train time.

Plant Visits

Only one special group plant visit has been arranged. This will be conducted the afternoon of Monday, May 6, and will be to the blast furnace, coke plant and steel mill of the Wisconsin Steel Division, International Harvester Co. Busses for the trip will be loaded at the Amphitheatre beginning 12:30 P. M. Monday, May 6. The busses on the return trip will stop at the Museum of Science and Industry where the Museum officials have provided for a special inspection of the foundry exhibit, one of the world's outstanding exhibits. Busses will then return the members to the Palmer House.

During the week, at the registration desk, the Chicago Chapter will have members of their plant visitation committee in attendance and provided with information as to plants open for inspection, hours of inspection and transportation means. The companies which have already

Towers of Chicago

Host to 44th Annual Convention

listed their plants for inspection are:

Allied Steel Casting Co.
American Steel Foundries (East Chicago).
Carnegie-Illinois Steel Corp. (South Works).
Chicago Malleable Iron Co.
Continental Roll & Steel Foundry Co. (East Chicago).
Crane Co.
Griffin Wheel Co.
Illinois Clay Products Co. (Joliet, Ill.).
Interlake Iron Corp.
International Harvester Co. (McCormick & Tractor Plants).
Link-Belt Co.
Liquid Carbonic Co.
Melrose Park Plant, National Malleable & Steel Castings Co.
Western Electric Co.
Whiting Corp.

Awards and Awards Address

As announced last month, the main session of the convention will be the business meeting, Wednesday morning, May 8, featuring the Board of Awards address which will be given by the executive vice president of the General Motors Corp., Charles E. Wilson. At this same session, President Washburn will give his presidential address and gold medals will be awarded to F. K. Vial, Griffin Wheel Co.; N. K. B. Patch, Lumen Bearing Co., and past president A. F. A.; F. A. Melmoth, Detroit Steel Castings Co., and H. W. Dietert, Harry W. Dietert Co. The election of officers and board members will be completed at this time.

Annual Dinner

The annual Association dinner, the evening of Thursday, May 9, will be the main social event of the week for the members, guests and their ladies. The members have been sent a special announcement of this dinner with advance reservation cards. The type of entertainment will be unusual for, instead of the usual series of addresses, the Association in co-operation with the Chicago Chapter committee, is arranging an entertainment program which, in keeping with the occasion, will be especially enjoyable to all. This entertainment will be modelled along the lines of the Annual Ladies' Night of the Chicago Chapter which has established an enviable reputation.

Crystallization Demonstration

A feature of the technical program is the crystallization demonstrations by Dr. C. W. Mason, Cornell University. Because of its great educational value to the many working with cast metals, Dr. Mason will give the demonstration three times during the convention, on Tuesday, May 7; Wednesday, May 8, and Thursday, May 9. The showing will be at the Palmer House in the Club Building Dining Room where good facilities for the demonstration will be available.

Ladies' Entertainment Program

The Chicago Chapter ladies' entertainment committee is planning a comprehensive series of events beginning with a tea at the Palmer House the afternoon of Monday, May 6. All ladies registering will be furnished with a program of the events which will include tours, luncheons, dinners and a style show. Those wishing to participate in any of these events will register for them at the ladies' headquarters, Room 11, Palmer House.

George Long

GEORGE A. T. LONG, whose election to honorary life membership in the A.F.A. was announced last month has been in charge of the foundry service department of Pickands Mather & Co. for the past 37 years. He was born in Chicago and learned the trade of molding at the Union Brass and Iron Co. of that city.

After a short time Mr. Long then went to Detroit and entered the employ of the Hodge Iron Works and subsequently became connected with the Michigan Malleable Iron Co. After a number of years of service with the Michigan Malleable Iron Co., Mr. Long was then employed by the Semet-Solvay Co. of Detroit as metallurgist.

In 1903 Mr. Long returned to Chicago to enter the employ of Pickands Brown & Co. and subsequently Pickands Mather & Co. in charge of their foundry service department. In this capacity Mr. Long has been in a position to render a unique and invaluable service to American foundrymen of the central western section of this country.

George A. T. Long

Mr. Long takes particular pride in the fact that he has attended every convention of the American Foundrymen's Association since the first one held in Philadelphia in 1896.

Exchange Papers to be Continued

DESPITE the unsettled world conditions due to the war, the exchange of papers for annual meetings is being continued this year between the A.F.A. and the Institute of British Foundrymen. It is extremely gratifying to note that this exchange, first begun in 1921, has continued without a break over these years and that it has resulted in a much better understanding between the members of the two organizations than would otherwise have been possible.

For the A.F.A. annual meeting in May, the Institute of British Foundrymen is furnishing a paper prepared by J. J. Sheehan of the Austin Motor Co., Ltd., Birmingham, England. Mr. Sheehan's paper will discuss sand control in British foundries.

The A.F.A. exchange paper for the British meeting is being

C. C. Brisbois

A. E. Cartwright

prepared by A. E. Cartwright and C. C. Brisbois, Robert Mitchell Co., Ltd., Montreal, P. Q., Mr. Brisbois being foundry superintendent and Mr. Cartwright metallurgist. Their paper, "Development of Some Gating and Feeding Methods for High Duty Alloys," discusses some very interesting data developed since the presentation of their paper on the same subject before the 1938 A.F.A. convention.

Patternmaking Division to be Formed

WHILE for several years the program committee has sponsored patternmaking sessions at the annual conventions, no formal patternmaking division, similar to the steel, gray iron, malleable and non-ferrous divisions, has existed. Because of the increasing interest in the technical phases of patternmaking and to better serve that section of the industry, plans have been promoted to organize a patternmaking division of the A.F.A. during the Chicago convention. Announcement of the purpose and organization of the division will be made at the patternmaking session to be held the afternoon of Tuesday, May 7. This meeting will be in Room 2, Second Floor of the International Amphitheatre.

Presiding at the meeting will be Vaughan Reid, president, City Pattern Works, Detroit. At that time a report will be made by Frank C. Cech, pattern instructor, Cleveland Trade School, and V. J. Sedlon, Master Pattern Company, Cleveland, on a survey of pattern coating materials. At the same session, G. V. Lustig, Barber-Colman Company, Rockford, Ill., will report on the use of pattern color markings.

Mr. Reid has for years been actively connected with the pattern committee of the Association, which as one of its major activities developed standard color markings for wood patterns and core boxes, a standard later approved by the Dept. of Commerce as Commercial Standard CS 19-30. These standards for color markings have been used extensively throughout the country. Mr. Lustig's paper at the convention patternmaking session will propose some changes in these standards.

Dr. Ries Honored

DR. H. RIES, Technical Director, Foundry Sand Research Committee of the American Foundrymen's Association and formerly Head of the Geology Department, Cornell University, Ithaca, N. Y., has just been elected to life membership by the Council of the Canadian Institute of Mining and Metallurgy. Dr. Ries' citation reads that he was so elected because of "long and distinguished service."

New England Association Hears Talk on Facings

By M. A. Hosmer,* Boston, Mass.

THE New England Foundrymen's Association held its regular monthly meeting April 10 at the Engineers' Club in Boston. President Francis LeBarron presided during the evening and the speaker was Dr. J. A. Ridderhof, director of research, F. B. Stevens, Inc., Detroit, Mich.

Dr. Ridderhof's subject, "Foundry Facings," proved to be of more than ordinary interest and attracted an audience of 60 or more guests and members. He divided the address into three main divisions—a. Seacoal facings, b. Core washes and derivatives, and c. Partings.

In discussing the first topic, he said that seacoal facing affects all the physical properties of molding sand one way or another. Usual tests run on facings are volatile matter, sulphur, ash and moisture. The main function of a good seacoal facing as selected by the above tests was to form a so-called gas cushion on the surface of the mold, resulting thereby in a good finish on the casting surface. It also performs the additional function of creating a reducing atmosphere in the mold and therefore results in reducing the number of scrap castings.

The speaker defined core wash as any material used to coat the surface of a core or mold. It is usually mixed with water and applied with brush, spray, or by dipping. The consistency of such solutions is important and may be kept uniform from time to time by means of a hydrometer in which the readings are expressed in degrees Baume, or by determining the fiscosity of the mixture regularly. Mechanical mixers are better in keeping the solution stirred up than mixing by hand. Points which should be followed in mixing core wash are—

(1) Use a material that will mix readily; (2) Allow the solution to stand several hours before using; (3) Provide continuous agitation (4) Have solution at proper consistency; (5) See that it soaks to proper depth in mold; (6) It must not ferment or foam on surface; (7) It must adhere firmly to the mold surface; (8) It must be sufficiently heat resisting; (9) It must not crack on the surface of the mold; (10) It must peal the casting well.

By using high grade material, the time saved in the cleaning room might well pay for the entire amount of core wash used. Plumbago, which is a graphite base material, is generally used in green sand work and gives a fine casting surface. Plumbago is held on the surface largely by the moisture present on the sand surface of the mold. It must not be applied too thick or too hard on the surface of a mold where the sand contains seacoal.

Dr. Ridderhof concluded with a brief discussion of partings which he said were of various materials such as tripoli, silica, beam dust, etc., after which a very interesting general discussion and question period followed.

*Hunt-Spiller Mfg. Corp.

Schedule of Sessions and Events, 44th Annual Convention

In presenting this schedule of convention sessions and events attention is called to the meeting room locations. The Foundry and Allied Industries Show will be housed in the International Amphitheatre 42nd and Halsted Sts., Chicago. The downtown headquarters hotel will be the Palmer House from which busses will leave at regular intervals for the Amphitheatre where all convention sessions during exhibit hours will be held. The sessions Wednesday morning, May 8, and all evening sessions will be at the Palmer House.

The general registration will be at the Amphitheatre. Ladies' registration will be in Room 11, third floor, Palmer House. Admittance to the Amphitheatre will be by badge obtained on registering. Times listed are daylight saving or eastern standard.

Saturday, May 4

1:00 to 10:00 P. M.—Chicago District Day at Exhibition
(A preview planned especially for plant executives and shop men of Chicago area.)

Monday, May 6

9:00 A. M. to 5:30 P. M.—Foundry Show Open
A. M. and P. M.—Committee meetings and plant visits.

11:00 A. M.—Gray Iron Shop Course
(Session 1)
Cupola Operation
Chairman, P. T. Bancroft, Moline, Ill.
Discussion Leader, John Grennan, University of Michigan, Ann Arbor, Mich.

12:30 P. M.—Group Plant Inspection Tour
Busses Load at International Amphitheatre
(To Plant of Wisconsin Steel Division of International Harvester Co., with return stop at Museum of Science and Industry to witness special showing of foundry exhibit).

7:00 P. M.—Engineering School and Plant Instructors' Annual Dinner
Presiding, F. G. Sefing, International Nickel Co., New York City.
Co-Chairman, C. H. Casberg, Dept. of Mech. Engrg., University of Illinois, Urbana, Ill.
Discussion Subject—Dissemination of Information on Cast Metals to Students

8:00 P. M.—Plant and Plant Equipment Session
Chairman, James Thomson, Continental Roll & Steel Foundry Co., E. Chicago, Ind.
Co-Chairmen, R. D. Brizzolara, American Steel Foundries, Chicago, and W. R. Jennings, John Deere Tractor Co., Waterloo, Ia.
Foundry Equipment at Indianapolis Plant, International Harvester Co., by F. H. Amos, International Harvester Co., Chicago
Cooling and Storage of Foundry Sand, by H. L. McKinnon, C. O. Bartlett & Snow Co., Cleveland.

Tuesday, May 7

9:00 A. M. to 5:30 P. M.—Foundry Show Open

9:00 A. M.—Sand Shop Course
(Session 1)
Non-Ferrous Shop Sand Control
Chairman, D. Frank O'Connor, Walworth Co., S. Boston, Mass.
Discussion Leader, Donald May, Crane Co., Chicago, Ill.

10:00 A. M.—Apprentice Training Session
Chairman, C. R. Culling, Carondelet Foundry Co., St. Louis, Mo.
Co-Chairman, C. J. Freund, Dean of Engrg., University of Detroit, Detroit, Mich.
An Adaptable Apprentice Program, by A. L. Armantrout, Carnegie-Illinois Steel Corp., South Works, Chicago, Ill.
A Graduate Apprentice's Review of His Training, by C. W. Wade, Caterpillar Tractor Co., Peoria, Illinois
Technique of Training Foundry Apprentices, by A. H. Wornom, Newport News Ship Building & Dry Dock Co., Newport News, Va.

10:00 A. M.—Malleable Cast Iron Session
Chairman, C. C. Lawson, Wagner Malleable Iron Co., Decatur, Ill.
Co-Chairman, D. P. Forbes, Gunite Foundries Corp., Rockford, Ill.
A Sand Control Program in a Malleable Foundry, by D. F. Sawtelle, Malleable Iron Fittings Co., Branford, Conn.
Composite Molding in a Malleable Foundry, by Sam Healy, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.
An Unusual Structure in Malleable Iron, by Enrique Touceda, Malleable Founders' Society, Albany, N. Y.

10:00 A. M.—Non-Ferrous Session
Chairman, Wm. J. Laird, Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.
Co-Chairman, R. W. Parsons, Ohio Brass Co., Mansfield, O.

TO PRESIDE AT CONVENTION SESSIONS


A. D. Lynch


H. H. Judson


J. H. Lansing


Vaughan Reid


C. H. Casberg


P. T. Bancroft

CHAIRMEN OF CONVENTION SESSIONS


R. W. Parsons


N. J. Dunbeck


Jas. Thomson


P. C. DeBruyne


C. P. Randall


W. H. Spencer

Tuesday, May 7 (Continued)

Melting of Copper Base Alloys to Retain Physical Properties, by Wm. B. George, R. Lavin & Sons, Chicago, Ill.

Improvements in Gas Melting Furnaces in the Non-Ferrous Foundry, by E. W. Williams, Equitable Gas Co., Pittsburgh, Pa.

Crucible Melting with Modern Gas Burners, by F. L. Wolf, Ohio Brass Co., Mansfield, O.

2:00 P. M.—Patternmaking Session

Chairman, Vaughan Reid, City Pattern Works, Detroit, Mich.

Pattern Coating Materials, by Frank C. Cech, Cleveland Trade School, Cleveland, O., and V. J. Sedlon, Master Pattern Co., Cleveland, O.

Pattern Color Markings, by G. V. Lustig, Barber-Colman Co., Rockford, Ill.

2:00 P. M.—Malleable Cast Iron Session

Chairman, R. J. Anderson, Belle City Malleable Iron Co., Racine, Wis.

Co-Chairman, D. I. Dobson, General Malleable Corp., Waukesha, Wis.

Effects of Manganese in Second Stage Graphitization, by D. P. Forbes, P. A. Paulson and G. K. Minert, Gunite Foundries Corp., Rockford, Ill.

Heat Treatment of Malleable Iron, by R. J. Cowan, Surface Combustion Corp., Toledo, O.

2:00 P. M.—Non-Ferrous Session

Chairman, Harold J. Roast, Canadian Bronze Co., Montreal, Que., Canada

Co-Chairman, Wm. Romanoff, H. Kramer & Co., Chicago, Ill.

Non-Ferrous Applications of Top Pouring Methods, by A. K. Higgins, Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Tentatively Recommended Practice on Sand Cast Foundry Bronzes, Red and Semi-Red Brasses

Non-Ferrous Division Annual Business Meeting Reports of Officers and Committees

4:00 P. M.—Gray Iron Shop Course
(Session 2)
Cupola Practice

Chairman, Horace Deane, American Brake Shoe & Foundry Co., Mahwah, N. J.

Discussion Leader, Donald J. Reese, International Nickel Co., New York City

5:00 to 7:00 P. M.—Smoker and Entertainment Program
(Sponsored by Committee of the Chicago Chapter)

8:00 P. M.—Refractories Session

Chairman, A. H. Dierker, Ohio State University, Columbus, O.

Co-Chairman, J. A. Kayser, Laclede-Christy Clay Products Co., St. Louis, Mo.

Comparison of Refractories for Cupola Service, by J. A. Bowers and Jas. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala.

Linings for Desulphurizing Ladles, by John Lowe, Vilter Mfg. Co., Milwaukee, Wis.

8:00 P. M.—Demonstration of Crystallization of Cast Metals (First Showing)

Presiding, H. H. Judson, Goulds Pumps, Inc., Seneca Falls, N. Y.

Close-Ups of Crystal Behavior Illustrated by Microprojection — Demonstration by Dr. C. W. Mason, Cornell University, Ithaca, N. Y.

Wednesday, May 8

8:30 A. M.—Sand Shop Course
(Session 2)
Gray Iron and Malleable Practice

Chairman, E. E. Woodliff, Harry W. Dietert Co., Detroit, Mich.

Discussion Leaders, Frank Brewster, Baker Perkins Co., and Charles Schofield, Chevrolet Motor Co., Gray Iron Foundry, Saginaw, Mich.

9:30 A. M.—Annual Business Meeting and Board of Awards Lecture

Presiding, President H. S. Washburn

Awarding of Medals

Address by Charles E. Wilson, Executive Vice-President, General Motors Corp, Detroit, Mich.

CONVENTION SESSION LEADERS


Wm. Romanoff


W. R. Jennings


H. Deane


E. E. Woodliff


C. R. Culling


Harold J. Roast

TO PRESIDE AT CONVENTION MEETINGS

W. G. Reichert

C. J. Freund

C. O. Thieme

G. P. Phillips

Jas. R. Allan

V. A. Crosby

Wednesday, May 8 (Continued)

11:00 A. M. to 6:00 P. M.—Foundry Show Open

12:30 P. M.—Non-Ferrous Division Round Table Luncheon

Presiding, C. O. Thieme, H. Kramer & Co., Chicago, Ill.

Discussion Subject—*Metal Covers, Fluxes, Deoxidizers and Degasifier Practice*

12:30 P. M.—Malleable Division Round Table Luncheon

Chairman, A. M. Fulton, Northern Malleable Iron Co., St. Paul, Minn.

Co-Chairmen, P. C. DeBruyne, Moline Malleable Iron Co., St. Charles, Ill., and J. H. Lansing, Malleable Founders' Society, Cleveland, O.

2:00 P. M.—Foundry Cost Session

Chairman, R. L. Lee, Liberty Foundry, Inc., Wauwatosa, Wis.

Round Table Discussion of Cost Methods

2:00 P. M.—Foundry Sand Research

Chairman, W. G. Reichert, American Brake Shoe & Foundry Co., Mahwah, N. J.

Co-Chairman, C. P. Randall, Hunt-Spiller Mfg. Co., Boston, Mass.

Flowability of Molding Sands, by P. E. Kyle, Massachusetts Institute of Technology, Cambridge, Massachusetts

Sand Affects Physical Properties of Gray Iron, by H. W. Dietert and E. E. Woodliff, Harry W. Dietert Co., Detroit, Mich.

Influence of the Mold on Shrinkage in Ferrous Castings, by H. Womochel and C. C. Sigerfoos, Michigan State College, East Lansing, Mich.

Notes on the Clay Bonding of Molding Sand, by Harry L. Daasch, University of Vermont, Burlington, Vt.

On the Relationship Between the Physical and Mineralogical Characteristics of Bonding Clays, by R. E. Grim and R. A. Rowland, Illinois State Geological Survey, Urbana, Ill. *(Paper Presented by Title)*

4:00 P. M.—Gray Iron Shop Course

(Session 3)

Chairman, V. A. Crosby, Climax Molybdenum Co., Detroit, Mich.

Cupola Control by Gas Control, by S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.

7:00 P. M.—Non-Ferrous Division Annual Dinner

Presiding, Division Chairman Harold J. Roast, Canadian Bronze Co., Montreal

8:00 P. M.—Demonstration of Crystallization of Cast Metals (Second Showing)

Presiding, A. C. Davis, Cornell University, Ithaca, New York

Close-Ups of Crystal Behavior Illustrated by Microprojection—Demonstration by Dr. C. W. Mason, Cornell University, Ithaca, N. Y.

Thursday, May 9

9:00 A. M. to 5:30 P. M.—Foundry Show Open

9:00 A. M.—Sand Shop Course

(Session 3)

Core Room Practice

Chairman, E. C. Zirzow, National Malleable & Steel Castings Co., Cleveland, O.

Discussion Leader, Fred Weaver, Great Lakes Foundry Sand Co., Detroit, Mich.

10:00 A. M.—Foreman Training Session

Chairman, A. D. Lynch, J. I. Case Co., Racine, Wisconsin.

Round Table Discussion

10:00 A. M.—Steel Castings Session

Chairman, T. N. Armstrong, International Nickel Co., New York City.

Co-Chairman, H. M. Rishel, American Steel Foundries, Granite City, Ill.

Application of External Chills in the Production of Steel Castings, by W. F. McKee, Key Co., E. St. Louis, Ill.

Committee Reports

10:00 A. M.—Sand Research Session

Chairman, D. L. Parker, General Electric Co., West Lynn, Mass.

Co-Chairman, N. J. Dunbeck, Eastern Clay Products Co., Eifort, O.

Recent Experiments with Gray Iron Synthetic Molding Sands, by Fulton Holtby and Herbert

GRAY IRON AND STEEL SESSION LEADERS

F. J. Walls

H. Bornstein

A. L. Boegehold

H. D. Phillips

F. A. Melmoth

D. C. Zuege

J. W. Bolton

H. Scobie

S. W. Brinson

J. A. Duma

H. Womochel

C. C. Sigerfoos

Thursday, May 9 (Continued)

Scobie, University of Minnesota, Minneapolis, Minnesota

Some Considerations of Effects of High Temperature on Sands, by Dr. H. Ries, Cornell University, Ithaca, N. Y.

Sand Control in British Foundries, by J. J. Sheehan, Austin Motor Co., Ltd.. Birmingham, England (Official Exchange Paper—Institute of British Foundrymen)

Report of Technical Director, Foundry Sand Research Committee

12:30 P. M.—Gray Iron Division Luncheon

Presiding, Division Chairman G. P. Phillips, International Harvester Co., Chicago

2:00 P. M.—Job Evaluation and Time Study in the Foundry

Chairman, Frank Wartgow, American Steel Foundries, East Chicago, Ind.

A Round Table Discussion Sponsored by A.F.A. Committee on Job Evaluation and Time Study

2:00 P. M.—Gray Iron Session

Chairman, G. P. Phillips, International Harvester Co., Chicago

Co-Chairman, W. H. Spencer, Wilkening Mfg. Co., Philadelphia, Pa.

Effects of Sulphur on Properties of Electric Furnace Cast Irons, by Fulton Holtby and R. L. Dowdell, University of Minnesota, Minneapolis, Minn.

Effect of Varying the Silicon Content of Cast Iron, by F. G. Sefing, International Nickel Co., N. Y. C.

Desulphurization of Cast Iron from Practical Operating Standpoint, by W. Levi, Lynchburg Foundry Co., Radford, Va.

2:00 P. M.—Steel Session

Chairman, H. D. Phillips, Lebanon Steel Foundry, Lebanon, Pa.

Co-Chairman, R. A. Gezelius, General Steel Castings Corp., Eddystone, Pa.

Effects of Welding on the Structures of Some Cast and Wrouhgt Steels, Presented by The Lunkenheimer Co., Metallurgical Division, Per A. J. Smith and J. W. Bolton, Cincinnati, O.

Chaplets and the Steel Casting, by H. F. Taylor and E. A. Rominski, Naval Research Laboratory, Anacostia Station, Washington, D. C.

A. H. Jameson

S. C. Massari

2:00 P. M.—Safety and Hygiene Session

Chairman, Jas. R. Allan, International Harvester Co., Chicago.

A Safety Program for Small Foundries, by P. E. Rentschler, Hamilton Foundry & Machine Co., Hamilton. O.

Workmen's Compensation and Occupational Disease Insurance, by Roger Bronson, Chicago, Ill.

4:00 P. M.—Gray Iron Shop Course
(Session 4)

Chairman, John Grennan, University of Michigan, Ann Arbor, Mich.

Ladle Additions of Graphite to Cast Iron, by A. H. Dierker, Ohio State University, Columbus, O.

Casting Defects Common to Automotive Gray Iron—Their Identification, Probable Cause and Control, by W. B. McFerrin, Cadillac Motor Car Division, General Motors Corporation, Detroit, Mich.

4:30 P. M.—Demonstration of Crystallization of Cast Metals (Third Showing)

Presiding, R. Schneidewind, University of Michigan, Ann Arbor, Mich.

Close-Ups of Crystal Behavior Illustrated by Microprojection—Demonstration by Dr. C. W. Mason, Cornell University, Ithaca, N. Y.

7:00 P. M.—A.F.A. Annual Dinner

Presiding, President H. S. Washburn.

As a section of the dinner the Chicago Chapter is sponsoring entertainment features and dance.

Friday, May 10

9:00 A. M. to 3:30 P. M.—Foundry Show Open

9:00 A. M.—Sand Shop Course
(Session 4)

Steel Foundry Practice

Chairman and Discussion Leader, L. H. Hahn, Sivyer Steel Casting Co., Chicago, Ill.

Discussion Leader, D. D. Cameron, Chicago Heights, Ill.

10:00 A. M.—Gray Iron Session

Chairman, H. Bornstein, Deere & Co., Moline, Ill.
Co-Chairman, A. L. Boegehold, General Motors Research Labs., Detroit, Mich.

The Damping Capacity, Electric and Thermal Conductivities and Endurance Properties of Some Gray Irons, by C. H. Lorig and V. H. Schnee, Battelle Memorial Institute, Columbus, O.

Cast Iron Cylinder Bores—Observations on Microstructure, Composition, Hardness and Wear, by E. K. Smith, Electro Metallurgical Co., Detroit, Mich.

Measuring the Tendency of Some Cast Irons to Seize Under Sliding Friction, by A. H. Dierker, Bernard Fried and H. H. Dawson, Ohio State University, Columbus, O.

(Concluded on Page 18)

NEW MEMBERS

Buffalo Chapter

H. K. Rose, Salesman, Swan-Finch Oil Corporation, Buffalo, N. Y.

Thomas D. West, Fdry. Supt., Symington Gould Corporation, Rochester, N. Y.

Central Indiana Chapter

John C. Bancroft, Met. Eng., The Perfect Circle Co., New Castle, Ind.

Richard H. Bancroft, Chief Met., The Perfect Circle Co., New Castle, Ind.

Caleb Bennett, Foreman, The Perfect Circle Co., New Castle, Ind.

Herman Clark, The Perfect Circle Co., New Castle, Ind.

Everett B. Jessup, Foreman Inspection & Cleaning, The Perfect Circle Co., New Castle, Ind.

C. B. Juday, The Perfect Circle Co., New Castle, Ind.

Knefler-Bates Company, Indianapolis, Indiana (Tom R. Johnson, Sales Manager)*

Robert Langsenkamp, Sales Repr., Langsenkamp-Wheeler Brass Works, Indianapolis, Ind.

Ralph K. Lorton, Sand Control, The Perfect Circle Co., New Castle, Ind.

J. A. Luby, Manager, Gartland Foundry Company, Terre Haute, Ind.

Dallas F. Lunsford, Asst. Met. & Ch. Chem., The Perfect Circle Co., New Castle, Ind.

Arthur C. Myers, General Foreman, The Perfect Circle Co., New Castle, Ind.

O. C. Ross, Indianapolis, Ind., Repr., American Air Filter Co., Louisville, Ky.

Central New York Chapter

Walter M. Maywitt, Instructor, Apprentice Training School, Syracuse, N. Y.

Chicago Chapter

Elizabeth Street Foundry Co., Chicago, Ill. (L. W. Lemme, Treas.)*

B. Emmet Hartnett, Owner, Hartnett Foundry Co., Chicago, Ill.

Fisher Furnace Company, Chicago, Ill. (P. J. Myall, Sales Manager)*

John Hume, Jr., Repr., Electro Refractories & Alloys Corp., Chicago

Jack M. Ingram, Heat Treat Sup., Continental Roll & Steel Fdry. Co., East Chicago, Ind.

T. W. MacLean, Chicago, Ill., Sales Repr., Lava Crucible Co. of Pittsburgh, Pittsburgh, Pa.

Bernard B. Moss, Apprentice Inspector, Griffin Wheel Co., Chicago, Ill.

W. Harvey Payne, President, W. Harvey Payne & Company, Chicago, Ill.

Walter C. Raithel, Sales Manager, Western Foundry Co., Chicago, Ill.

Robert A. Smith, Met. Engr., Sears Roebuck & Co., Chicago, Ill.

Western Metal Company, Chicago, Ill. (Cliff McKelvey, Sales Repr.)*

Detroit Chapter

Arthur Muehlbeck, Foreman Sand Slinger, U. S. Radiator Corp., Detroit, Mich.

Metropolitan New York Chapter

Arthur S. Kightlinger, Res. Lab., International Nickel Co., Bayonne, N. J.

Metropolitan Philadelphia Chapter

Fairmount Foundry, Inc., Philadelphia, Pa. (Edw. C. Benkert, Vice. Pres.)*

Northeastern Ohio Chapter

J. E. Dvorak, Eberhard Mfg. Co., Cleveland, Ohio.

William Love, General Manager, The Colonial Foundry Co., Louisville, Ohio.

Fred K. Minor, Cleveland, Ohio, Dist. Repr., American Air Filter Co., Louisville, Ky.

Northern California Chapter

Frank Botelho, Fdry. Foreman, Pacific Steel Casting Co., Berkeley, Calif.

Northern Illinois-Southern Wisconsin Chapter

John A. Forbes, Vice President, Gunite Foundries, Rockford, Ill.

Ontario Chapter

Sheldons Limited, Galt, Ont., Canada (Alvin E. Bock, Fdry. Supt.)*

Quad City Chapter

Cyril Tondreau, Supt., International Harvester Co., Rock Island, Ill.

St. Louis Chapter

R. H. Posch, Owner, Arpocalloy Company, Kansas City, Mo.

J. R. Booth, Supt., Southern Wheel Div., American Brake Shoe & Fdry. Co., St. Louis, Mo.

Southern California Chapter

Tom C. Muff, Fdry. Supt., Commercial Iron Works, Los Angeles, Calif.

Wisconsin Chapter

Burlington Brass Works, Burlington, Wis. (H. E. Harper, President)*

Henry Fuchs, Ampco Metal, Inc., Milwaukee, Wis.

Ed. Jagman, Ampco Metal, Inc., Milwaukee, Wis.

Erwin R. Knueppel, Ampco Metal, Inc., Milwaukee, Wis.

Richard Krumbiegel, Ampco Metal, Inc., Milwaukee, Wis.

Ruben Schroeder, Ampco Metal, Inc., Milwaukee, Wis.

G. F. Smitka, Ampco Metal, Inc., Milwaukee, Wis.

Maxwell Young Snow, Asst. Foreman, Allis Chalmers Mfg., West Allis, Wis.

T. E. Ward, Sales Mgr., Badger Malleable & Mfg. Co., South Milwaukee, Wis.

Outside Chapters

C. T. Greenidge, Research Met., Battelle Memorial Institute, Columbus, Ohio

George Harrison, Fdry. Supt., The Acme Shear Company, Bridgeport, Conn.

Harry R. Haskett, Manager, The Colorado Brass Foundry Co., Denver, Colo.

R. E. Kellogg, Cost Dept., Vermilion Malleable Iron Works, Div. Poor & Co., Hoopeston, Ill.

E. L. Le Baron Foundry Co., Brockton, Mass. (Francis Le Baron, Pres.)*

Oliver Farm Equipment Co., Charles City, Iowa (Howard W. Gustafson, Fdry. Supt.)*

Fred G. Roemer, Fdry. Supt., The Balmar Corporation, Baltimore, Md.

R. M. Ronald, Fdry. Supt., Electric Steel Foundry Co., Portland, Ore.

*Company Members

REGIONAL CONFERENCES

St. Louis Chapter Holds Third Annual Meeting at Kansas City

By J. W. Kelin*, St. Louis, Mo.

THE St. Louis District Chapter held its third annual extension meeting in Kansas City, Mo., Friday evening, March 29, at the Continental Hotel. A. O. Nilles of the Kansas City plant, Griffin Wheel Co., acted as chairman for the evening. Among those present were sixteen from St. Louis, a distance of about 300 miles.

A large and interested group from Missouri, Kansas and Oklahoma gathered in anticipation of a fine evening's discussion under the leadership of L. H. Rudesill of the Griffin Wheel Co., Chicago. Mr. Rudesill's subject was "Cupola Melting Practice." This subject was certainly most interesting in its presentation, embodying as a special feature quite a number of stereoptican slides illustrating various points of interest in connection with it. An extended round table discussion followed the presentation of the talk.

The secretary of the St. Louis District Chapter briefly directed attention to the many advantages of membership in the A.F.A. and stressed the excellent results which would probably be secured by the organizing of a Kansas City Chapter. St. Louis District Chapter Chairman L. E. Everett, George Mitsch, L. Desparois and others gave brief words of welcome.

*Federated Metals Div., A. S. & R. Co. and Secretary-Treasurer, St. Louis District Chapter.

Second Annual Rutgers Regional Foundry Conference Draws Record Attendance

By K. A. DeLonge*, New York City

FOGGY weather but clear thinking characterized the one-day session on the melting and testing of metals at the Second Annual Rutgers Regional Foundry Conference held March 30 at Rutgers University at New Brunswick, N. J. Sponsored jointly by the Metropolitan Philadelphia and Metropolitan New York-New Jersey Chapters of A.F.A. and the Department of Engineering, Rutgers University. The conference, under the supervision of a committee with F. G. Sefing, International Nickel Co., New York City, as chairman, attracted a record total of 220 men who ignored inclement weather and were rewarded with an excellent session and banquet. The subject discussed, "The Melting and Testing of Metals from the Viewpoint of Both the Producer and the Consumer," brought together a group with varying interests.

An address of welcome by Dr. Robert C. Clothier, president of Rutgers University, opened the morning session which was devoted to the melting of metals. Chairman Sam Tour, Lucius Pitkin Co., Inc., New York City, first introduced John Howe Hall, consulting metallurgist, Philadelphia, Pa., who dealt with the melting of steel. Mr. Hall gave a resume of the processes used in the steel foundry and pointed out the attributes and the disadvantages of converter, open hearth, crucible and electric melting procedures. The speaker described the trend of the last few years toward thoroughly oxidizing steel heats and then deoxidizing immediately before pouring to secure sound, ductile castings.

Introducing his talk on the melting of gray irons, Donald J. Reese, International Nickel Co., New York City, pointed out that selection of the melting unit for the gray iron foundry is based primarily upon economy since high quality cast iron can be produced with any of the furnaces in common use today. Data were presented regarding the initial cost, melting rate, fuel consumption and maximum metal temperature obtainable for the eight commonly used melting processes including cupola, air, roll, rotary, electric and open hearth furnaces and duplexing methods.

Non-ferrous melting was discussed by Harry Gieseke, Ajax Electrothermic Corp., Philadelphia, Pa., who described the use of crucible, reverberatory and electric melting furnaces and pointed out the important features of each type of unit. Detailed data were presented regarding comparative melting costs. Mr. Gieseke stated that the selection of the most satisfactory type of melting unit depended upon the alloys melted, quantity and size of castings, working week, continuity of orders, labor conditions and personal preferences or prejudices.

The afternoon session was confined to the testing and inspection of castings with Norman Mochel, Westinghouse Electric & Mfg. Co., Philadelphia, Pa., acting as chairman. Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Pa., presenting the producers' point of view, pointed out the different phases of producer inspection versus buyer inspection. Mr. Kuniansky illustrated the paradox of certain specifications which attempted to define not only the chemical analysis, but also the physical properties desired and suggested the need for greater freedom for the foundryman in this respect. "Plant inspectors," opined the speaker, "should report to the plant manager—not to the foundry superintendent."

Dr. N. E. Woldman, Eclipse Aviation Corp., Bendix, N. J.,

*Technical Secretary, Metropolitan N. Y.-N. J. Chapter, and International Nickel Co.

discussing the testing and inspection of castings from the consumers' viewpoint, stressed the importance of consumer-producer acquaintanceship as an aid to satisfactory interpretation of specifications. Set rules, he pointed out, interfere with intelligent inspection and very often result in the rejection of castings which are entirely satisfactory for their applications.

The highlight of the discussion following these two talks was a plea by Sam Tour for foundrymen to take a more active part in the setting up of specifications so that useless limitations—especially those regarding chemical analysis—can be eliminated and the task of the foundryman simplified.

The technical sessions were followed by a conference banquet presided over by toastmaster W. B. Coleman, W. B. Coleman Co., Philadelphia and Director, A. F. A. The speaker of the evening, Dr. Fraser Metzger, dean of men, Rutgers University, inspired his audience with an address based on the theme—"I Disapprove of the Philosophy that Teaches 'The World Owes Me a Living'."

Michigan State Conference Discusses Melting

OVER 150 foundrymen from the Michigan area attended the Eighth Annual Foundry Conference at Michigan State College, East Lansing, Michigan, April 12-13, jointly sponsored by the college and the Detroit Chapter. As in previous years, the conference was confined to the discussion of a particular subject. This year's subject was melting, covering gray iron, steel, malleable and non-ferrous.

The first meeting was held Friday morning, April 12, and prior to the opening of the technical session, H. W. Dietert, Harry W. Dietert Co., Detroit, Chairman, Detroit Chapter, presided and introduced Prof. W. L. Cockrell, Mechanical Engineering Department, Michigan State College, who, in turn, introduced Dean H. B. Dirks, Engineering Division. Dean Dirks' address welcomed visiting foundrymen and explained to them the growth of the college during recent years.

The first section of the technical meeting was presided over by V. A. Crosby, Climax Molybdenum Co., Detroit, who introduced the speaker, D. J. Reese, International Nickel Co., Inc., New York, who spoke on developments in gray iron melting. Mr. Reese's talk centered around what he thought should be the necessary attributes of a melting foreman in a gray iron foundry. During the second part of the session, D. M. Curry, H. Kramer & Co., Chicago, acted as chairman, while G. K. Eggleston, Detroit Lubricator Co., Detroit, explained the various advancements which have been made recently in the melting of non-ferrous metals. Mr. Eggleston brought these various melting methods down from ancient to modern times.

During the noon hour, luncheon was served in Michigan State Union Building, at which Lieut. H. F. Mulbar, Michigan State Police, explained the various methods used for the detection of crime in the State of Michigan. Music at the luncheon was provided by a string trio from the Music Department of the college.

At the afternoon session, F. A. Melmoth, Detroit Steel Casting Co., Detroit, presided over the first section of the program which dealt with modern methods of steel making for steel castings. C. E. Sims, Battelle Memorial Institute, Columbus, Ohio, was the speaker.

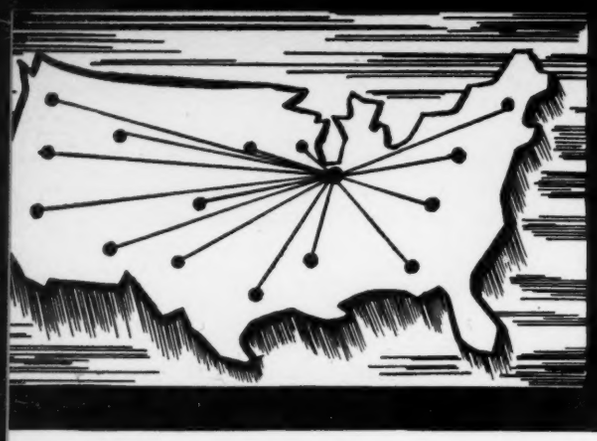
The second part of the program was presided over by J. H. Lansing, Malleable Founders' Society, Cleveland, Ohio, and the speaker was Carl Joseph, Saginaw Malleable Iron Division, General Motors Corp., Saginaw, Mich. Mr. Joseph's talk was devoted to melting requirements for pearlitic malleable irons and during his talk he showed the effect of raw materials, particularly pig iron, on the nodule size on that metal.

R. G. McElwee, Vanadium Corp. of America, Detroit, presided at the third session of the afternoon program which was devoted to a discussion of the solidification of cast iron by Dr. R. Schneidewind, University of Michigan, Ann Arbor, Mich. Dr. Schneidewind's talk revolved about the use of a wedge to determine the type of microstructure and properties that might be expected in an iron of a given type in various section sizes.

The Annual Banquet was held in the Main Dining Room of the Michigan State College Union Building at 6:30 P.M. with H. W. Dietert, Detroit Chapter Chairman, presiding. Following the dinner, Chairman Dietert introduced F. A. Melmoth, chairman of the committee in charge of the conference, who, in turn, introduced members of his committee. This was followed by an introduction of the speakers and chairmen for the following day's session. After these formalities, Chairman Dietert called on Prof. Cockrell who introduced C. W. Otto, Lansing Chamber of Commerce, who acted as toastmaster for the evening. Mr. Otto introduced L. B. Barnhart, Speech Department, Michigan State College, who spoke very interestingly on "Back Stage in the Broadcasting Studio."

The first section of the Saturday morning, April 13, session was presided over by Prof. Cockrell who introduced C. C. Sigerfoos, Mechanical Engineering Dept., Michigan State College, co-author with Howard Womochel of the same institution, of a paper on "Factors Affecting Shrinkage in Foundry Metals." This paper was very interesting and will be presented at the forthcoming convention of A.F.A. in Chicago. The remainder of the program was presided over by Vaughan Reid, City Pattern Works, Detroit, who introduced H. W. Dietert who spoke on "The Mechanical Properties of Castings as Af-

(Continued on Page 17)



Chapter Activities

Caterpillar Inspection Methods Described by Johnson

By Pat Dwyer*, Cleveland, Ohio

APPROXIMATELY 175 members and guests of the Northeastern Ohio Chapter attended the March 14 meeting at the Tudor Arms, Cleveland, to receive the report of the nominating committee on officers and directors and to hear an exceptionally interesting talk on inspection of castings by M. D. Johnson, chief of inspection staff, Caterpillar Tractor Co., Peoria, Ill.

According to Mr. Johnson, inspection is the art of critical examination by standards of comparison which are actual or theoretical, for the purpose of judging the value of the part in question for use in its particular place. Inspection is an operation not to see how much you can reject, but to insure accuracy with a minimum of rejections. The inspection department safeguards the quality of the product. An inspection department does not function properly unless supported by the management.

In addition to checking castings for size, shape and dimensional accuracy, the inspector must be in a position to recognize exterior and in many instances interior defects including cracks, cold shuts, shrinks, porosity, gas holes, sand holes, slag, dirt, strains, inaccurate locating points, core shifts, mismatches, hard spots and chilled iron. The speaker presented a detailed reference to the many practices and devices employed in detecting defects, altogether or partly hidden. Visual inspection conveys all the necessary information in approximately 90 per cent of the cases examined. Difference in sound of two castings when struck with a hammer indicates a defect. Porosity or other similar defects is detected by coating the casting with kerosene oil and then applying chalk. The method has advantages and disadvantages. Practically invisible cracks will show up where the casting is sprayed with a light coat of paint. In the magnaflux method a magnetic current is passed through the casting and a proprietary powder or solution is applied to the surface. In the so-called Bullard-Dunn cleaning process, the castings are put through successive baths of hot caustic, cold water, acid, cold and hot water. A pointed hammer in the hands of an experienced inspector shows up many interior defects. Some castings are subjected to oil and water tests. Accuracy of pattern is tested on a surface plate. A file is employed to detect hard spots. The x-ray is coming into more prominence. The speaker directed attention to the fact that valuable lessons can be drawn in the foundry from an examination of rejected castings.

Nominations for officers, with the election to take place at a later meeting, were: President, F. Ray Fleig, Smith Facing & Supply Co.; vice president, Frank J. Dost, Sterling Foundry Co., Wellington, O.; secretary, B. F. Lambert, Diamond Alkali Co.; treasurer, Russell F. Lincoln, Osborn Mgr. Co. A change in the by-laws to increase the number of directors from 9 to 15 resulted in the following nominations: For 1 year, Sterling N. Farmer, Sand Products Co.; Frank Opatrny, Frederic B. Stevens Co.; for 2 years, William J. Feth, Forest City Foundries Co.; John C. Maher, Ohio Foundry Co.; for three years, William Goebert, Bowler Foundry Co.; J. G. Goldie, Cleveland Trade School; Ernest F. Hess, Ohio Injector Co., Wadsworth, O.; W. O. Larson, W. O. Larson Foundry Co., Grafton, O.; John H. Tressler, Hickman, Williams & Co.

*Engineering Editor, The Foundry.

Aluminum Alloy Castings at Quad City

By J. Morgan Johnson*, Moline, Ill.

THE March 18 meeting of the Quad City Chapter was held at the Blackhawk Hotel, Davenport, Ia., with Herman Alex, Rock Island Arsenal and chapter chairman, presiding. Chairman Alex introduced John Diedrich, Blackhawk Foundry & Machine Co., as technical chairman who presented the speaker of the evening, H. J. Rowe, Aluminum Co. of America, Cleveland. Mr. Rowe's topic was "Aluminum—Its Uses, Processing and Recent Developments." A very interesting discussion of the more important developments of aluminum were given, as important ones as the art of casting, alloying, design requirements, fabrication, heat treatment and finishes of alloys of aluminum. Under the art of casting the various processes as sand casting, permanent molds, and die casting were reviewed and many uses given in each

*Tri-City Mfrs. Assn. and Secretary-Treasurer, Quad City Chapter, AFA.

case. The alloys of aluminum are many, and of such a nature that all engineering requirements have been met and many uses have come for the use of this metal, which has brought about further requirements necessary in the design that will fit into the various fields.

Through the development of heat treatment of aluminum alloys, it has brought about many uses where fabrication is important and fields for additional use where strength and weight have been necessary to consider, as in many of the modern developments such as streamline design.

A very instructional and broad viewpoint of the aluminum industry as to mining, processing and the uses of the metal were given in a sound film which Mr. Rowe presented after his talk.

Ontario Chapter Holds Successful Group Meetings

By G. L. White*, Toronto, Ont.

FOLLOWING the plan which met with such a hearty reception last year, the Ontario Chapter, for its meeting of February 23rd, at Rock Garden Lodge, Hamilton, divided into four groups for discussions of steel, non-ferrous metals, cast iron, and malleable iron. At the dinner preceding the group meetings, over one hundred were present and D. J. Macdonald, Chapter Chairman, Dominion Radiator and Boiler Co., Toronto, presided.

The largest of the group meetings with chapter chairman D. J. Macdonald, presiding was devoted to the study of cast iron, and more particularly high strength cast iron. A very fine paper on the fundamental metallurgy of cast irons, the methods of achieving high test irons, and the practical production of these materials in the cupola was given by J. C. Stavert, metallurgist, Babcock-Wilcox & Goldie-McCulloch, Galt, Ontario. It was shown that proper selection of raw materials and good control of cupola melting were important factors in the production of cast irons having tensile strength of 40,000 lbs. per sq. in. and higher. The importance of these high test irons at a time when the gray iron foundry finds itself in increasingly keen competition with other metals, and even plastics, was stressed. The discussion which followed centered around the high strength cast irons, with excursions into the relative wear resistance of fine and coarse grained irons, and the influence of alumnium additions.

The non-ferrous group discussion was led by Joseph Sully, Sully Brass Foundry, Ltd., Toronto, with aluminum alloys and foundry practice coming first in time and importance. It was suggested that 92% aluminum—8% copper alloy was most suitable for good results in polished surfaces and elimination of black spots, with the use of 95% aluminum—5% silicon alloy advisable under certain conditions. Good production practice involves the use of ingot metal and a good flux; keeping pouring temperatures low, especially for pressure work, and paying attention to sand conditions. Top pouring with small gates was favoured for unequal sections. Furnaces for brass melting were discussed, including a new development of a forced draft coke or coal furnace. The failure of manganese bronze in service after having passed the required physical tests was thought to be due to fatigue of metal or change in structure.

The feature of the malleable iron group meeting under the leadership of D. M. Storey, Fittings, Ltd., Oshawa, Ont., was a paper on "Short Cycle Malleable Iron" by N. C. MacPhee, chief metallurgist, and H. H. Fairfield, assistant metallurgist, McKinnon Industries, Ltd., St. Catharines, Ont. They described how the cost of malleable iron was lowered without affecting its high quality by reducing the traditional seven-day anneal to from 15 to 40 hours. For short annealing the characteristics of the iron must be closely controlled and this is achieved through attention to raw materials, melting practice, and chemical analysis. In short annealing, castings are exposed to a furnace atmosphere which is carburizing but not oxidizing. The temperature cycle is adjusted to get the maximum properties in the shortest time. The cycle is as follows: heat up to 1720° F. in

*Canadian Metals & Metallurgical Industries.

Ontario Chapter Members Get Together at Dinner in Toronto on March 29

nine hours, hold for twelve hours, cool to 1400°F. in three hours, and cool from 1400°F. to 1325°F. in eleven hours.

The steel group was small but under the able direction of A. C. Texter, Atlas Steels, Ltd., Welland, Ont., a very informative discussion was held.

Magnesium Alloys at March Meeting

At the meeting of the Ontario Chapter on March 29th, Joseph Sully, Sully Brass Foundry, Ltd., presided while Dr. W. F. Chubb spoke on the "Casting of Magnesium Alloys." Dr. Chubb pointed out that the lightness of magnesium alloys and their good strength when compared with other materials on the basis of weight were important factors in promoting their increased use, especially in aircraft. Alloying additions to magnesium do not exceed 12 per cent in the range of useful alloys and consist principally of aluminum, zinc, and manganese, with copper, lead, silicon, etc., sometimes used.

Any foundry that is well versed in aluminum alloy practice can readily turn to magnesium alloys if certain general principles are observed. Perhaps the most important requirement is the protection of magnesium alloys from oxidation. they may be melted in gas-fired, oil-fired, or induction furnaces with access of air prevented by a protective atmosphere of sulphur dioxide or hydrogen, or by a suitable flux consisting of about 68 per cent magnesium chloride, 25 per cent potassium chloride, and small percentages of sodium and calcium fluorides. About three per cent flux is used on the weight of metal being melted and is introduced largely at the bottom of the crucible.

Because of its high reactivity, molten magnesium alloy must be protected from the action of water in green sand molds by the addition of suitable materials to the sand. Sulphur additions provide a protective sulphur dioxide atmosphere, while such compounds as ammonium fluoride passivate the surface of the metal. Some materials, such as boric acid and phosphates, combine these two types of protective action. Commonly used addition agents are boric acid and sulphur, ammonium fluoride, and ammonium fluoride and sulphur. The sand used for casting magnesium alloys should have high permeability to handle the large volumes of gas given off on solidification.

The properties of sand cast magnesium alloy parts may also be improved considerably by suitable heat treatment. Temperature, time of heating, and method of cooling or quenching varies with the alloy and the particular properties that it is desired to obtain.

Greenly Discusses Training At Central Indiana Meeting

By R. A. Thompson*, Indianapolis, Ind.

THE youngest chapter, Central Indiana, continued at its April 8 meeting its splendid record of getting out over 100 at its monthly meeting, there being about 125 present at the Washington Hotel, Indianapolis, at this, the final meeting of the season. Chapter Chairman I. R. Wagner, Electric Steel Castings Co., presided, with the speaker being Russell J. Greenly, chairman of Trade and Industrial Education of Purdue University.

Dr. Greenly stressed "Training for Industry," discussing the work that Purdue is doing in cooperation with business and schools in many of the cities of Indiana. Definite programs are now in operation in schools teaching and equipping students for jobs in their immediate communities, with the programs throughout the state being enlarged.

Announcement was made that the present officers and board which had functioned for the short time since the chapter was organized were re-elected for the coming year. The chapter has made rapid progress and is attracting attendance at its meetings from a wide range of cities in the Indianapolis area. Membership has grown from an initial 34 to 107 at present, great credit being given for this increase to the able work of the membership committee under the direction of Lloyd Davis, Republic Coal and Coke Co.

*Electric Steel Castings Co. and Secretary, Central Indiana Chapter.

I. R. Wagner
Chairman
Central Indiana Chapter

Piper Addresses Cincinnati Chapter

By E. T. Korten*, Cincinnati

TUESDAY evening, April 9, members of the Cincinnati District Chapter met at the Gateway Restaurant, where the Gateway's fine steak dinner was served. With some 100 members and guests present, chapter chairman Herman Ewig, Cincinnati Milling Machine Co., presided during the meeting. W. F. Piper, Beardsley & Piper Co., Chicago, entertained the chapter with colored movies of his recent trip to Alaska. These were followed by another film of Mr. Piper's entitled, "Foundries Around the World." Both films were greatly enjoyed by those present.

Chairman Ewig announced the appointment of a nominating committee consisting of E. T. Korten, chairman, Ray Redmond, Buckeye Foundry Co.; R. G. Ebersole, Miller & Co.; C. R. Hilb, H. Kramer & Co., and L. A. Gosiger, S. Obermayer Co. This committee will report at the next meeting, May 21, at which time the speaker will be W. M. Ball, Jr., of the Edna Brass Mfg. Co.

*Reliable Pattern & Castings Co. and Secretary, Cincinnati District Chapter.

Barlow Discusses Copper in Iron Before New England Association

By M. A. Hosmer*, Boston, Mass.

ANOTHER interesting meeting was held by the New England Foundrymen's Association on March 13 at the Engineers Club, Boston, with President Francis Le Barron presiding. Some 65 members were on hand to hear T. E. Barlow, metallurgical engineer, Copper, Iron and Steel Development Association, present a paper on "Copper in Iron."

Mr. Barlow explained that copper when used in iron acts as a mild graphitizer or chill reducer, is about one-quarter as powerful as silicon, half as powerful as aluminum and acts nearly the same as nickel for this purpose. He stated that copper is a pearlite stabilizer and increases the machineability as well as hardness in a casting; or in other words, for any given hardness, irons containing copper machine more readily than the same irons with no copper. Also in combination with molybdenum and chromium, it is extremely effective in producing high strength. It is, however, less effective in this respect in combination with chromium alone. In combination with molybdenum and chromium, irons have been produced up to 80,000 lbs. per square in. tensile strength.

Copper is added in varying percentages up to 3.5 per cent, above which amount it tends to separate out of solution and becomes ineffective as an alloying element. It is best introduced into the metal in the form of shot and it is essential to use a pure grade of the element in every case. It may also be added directly to the cupola charge, but this practice is not preferable to ladle additions unless a large percentage of the castings made are copper contained. Although a slight mechanical loss is sometimes obtained, no oxidation loss is experienced. It has been found effective in reducing porosity and shrink in certain types of castings. After showing a number of slides of charts, tables and typical castings on the screen, the meeting was thrown open for discussion, during which period many interesting facts were brought out.

*Chemist, Hunt-Spiller Mfg. Corp.

Management Problems

DR. CHARLES REITELL of Stevenson, Jordan & Harrison, New York City, widely known as an expert and engineer in management problems was the speaker before the April 8 meeting of the Chicago Chapter. Chapter chairman C. E. Westover, presiding at the meeting first called for reports on plans of the various chapter committees for the annual convention. P. V. Martin, Carnegie-Illinois Steel Corporation, reported on the plans for the annual dinner entertainment program and Jas. Thomson, Continental Roll & Steel Foundry Company, outlined the ladies' entertainment schedule. C. E. Hoyt, executive vice president, A.F.A., discussed the Foundry Show possibilities, stressing the Preview day of May 4.

Dr. Reitell was introduced by G. P. Phillips, International Harvester Co. and chairman of the program committee. In his talk Dr. Reitell discussed the major groups of foundry executives and the principal factors of management each had before it. Price, volume, costs and net profits and the effects of their variations were listed as the prime considerations.

The application of a flexible budget system was presented and discussed, together with the foreman's responsibility of cost control in their departments. This was gone into in considerable detail by Dr. Reitell who showed how performance data were obtained and used as measures of results. He advocated frequent reports on performance to interest foremen and give them a guide in their supervision efforts.

Chairman Westover announced the election of officers and directors as follows:

For Chairman—G. P. Phillips, *For Vice Chairman*—L. L. Henkel, Interlake Iron Corp., *For Secretary*—B. L. Simpson, National Engineering Co., *For Treasurer*—C. C. Kawin, Chas. C. Kawin Co., *For Directors to serve three years*—M. J. Lefler, Western Foundry Co.; T. J. Magnuson, J. S. McCormick Co.; H. A. Forsberg, Continental Roll & Steel Foundry Co.; C. E. Westover, Burnside Steel Foundry Co.

Southern California Reports Nominations

W. F. HAGGMAN, secretary of the Southern California Chapter reports that the chapter nominating committee recently presented the names of the following for consideration at the chapter election:

For Chairman—James E. Eppley, Kinney Iron Works, Vernon, Calif.

For Vice Chairman — Glenn Merrefield, Warman Steel Casting Co.

For Treasurer — Earl Anderson, Enterprise Foundry Co.

For Secretary—W. F. Haggman, Foundry Specialties Co.

For Directors to serve two years—

B. G. Emmett, Los Angeles Steel Castings Co.

James O'Hara, Frater Valve & Fittings Co.

A. G. Barker, Barker Foundry Supply Co.

H. E. McGowen, H. E. McGowen Co.

Fire Brick at Buffalo

By J. R. Wark*, Buffalo, N. Y.

THE Buffalo Chapter held its regular monthly meeting April 5 at the Hotel Touraine with chapter chairman W. J. Corbett, Atlas Steel Foundry Co., presiding. Some 75 members were present to hear Fred W. Schroe-

*Queen City Sand & Supply Co. and Secretary, Buffalo Chapter, AFA.

der, ceramic engineer of A. P. Green Fire Brick Co. of Mexico, Mo., present a paper on "The Practical Application of Fire Brick." In his talk, Mr. Schroeder interpreted technical data on fire brick in such a manner that it could be used as a guide in selecting the grade or type of refractory which should be used to best resist a specific set of conditions. Slides were used to better illustrate some of the points. One of the chapter's most interesting discussion periods followed this talk. A talkie picture, "Play Ball America," was presented through the courtesy of General Mills immediately after dinner.

The May meeting of the chapter will be held on the 17th with Chas. W. Briggs, Steel Founders' Society of America, delivering an address on "Radiography", discussing the radiographic standards set up for steel castings for high pressure service.

Detroit Chapter Hears Dr. James T. MacKenzie on Multiple Cupola Melting

By O. E. Goudy*, Detroit, Mich.

THE Detroit Chapter held its regular monthly meeting on Thursday, March 7, at the Fort Shelby Hotel. Approximately 150 persons were in attendance. Chairman H. W. Dietert presided and Jack Lathrop, advertising manager, *The Foundry*, entertained with some sleight of hand, followed with a short talk on foundry statistics. It was of particular interest to know that Michigan ranks fifth in number of foundries and third in tonnage poured.

The guest speaker of the evening was Dr. James T. MacKenzie, chief metallurgist of the American Cast Iron Pipe Co., who had for his subject "Multiple Cupola Melting." Dr. MacKenzie explained how, at their plant, many sizes of centrifugal cast iron pipes are made, and, naturally, iron of various analyses is required. This has been accomplished by mixing iron of a certain composition, from one cupola, with that from another cupola, and, thereby getting the desired analysis and physical properties.

Of particular interest in Dr. MacKenzie's talk was the ease with which it was reported they are able to produce an iron with a very low carbon content, with little or no steel. This has largely been accomplished through a change in coke ratio, which is of a particular type most suited to their work. Among the various irons produced to meet certain requirements was one of about 2.25 per cent carbon and 4.00 per cent silicon. A general discussion followed, during which Dr. MacKenzie answered many questions relative to their cupola practice.

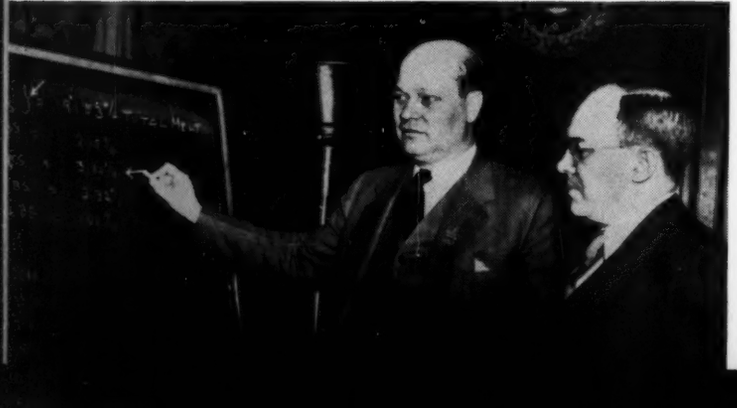
*Kelsey-Hayes Wheel Co. and Reporter for Detroit Chapter, AFA.

Wisconsin Holds Three Group Meetings

By A. C. Ziebell*, Oshkosh, Wis.

THE Wisconsin Chapter at its March 15 meeting tried an experiment in that following the chapter dinner those present were divided into three subgroup sessions. W. A. Hambley, Allis-Chalmers Mfg. Co., presided at one session devoted to a discussion of foundry costs for the gray iron and non-ferrous foundries. George Zabel, Fairbanks Morse & Co., Beloit, assisted by Lloyd Schneider, foundry cost accountant for his company, presented the leading discussion. For the steel session, H. W. Dietert, Harry W. Dietert Co., Detroit, presented a talk on steel facing sands, while Paul Power, Maynard Electric Steel Casting Co., Milwaukee, presided. At the malleable session, Frank Harris, Belle City Malleable Iron Co., Racine, presided, with N. J. Dunbeck, Eastern Clay Products Co., Eifort, discussed molding sands.

*Universal Foundry Co. and Secretary, Wisconsin Chapter.



George Zabel (left) and W. A. Hambley at Wisconsin Chapter Meeting

St. Louis Discusses Facings and Fluidity

By J. W. Kelin*, St. Louis, Mo.

ONE of the largest crowds of the year attended the April 11 meeting of the St. Louis District Chapter in spite of a totally unexpected spring snow storm. The meeting, as usual, was in charge of chapter chairman L. E. Everett, Key Co. During the business session special emphasis was given the national convention and special attention was directed to the apprentice training contests held by the chapter to select entries for the national contest in Chicago. During the course of the business session which included various committee reports, etc., the chapter voted not to have a regional conference this fall.

Following a brief intermission, F. Ray Fleig of the Smith Facing & Supply Co., Cleveland, was introduced by chapter vice chairman W. Carter Bliss, Scullin Steel Co. Mr. Fleig's subject, "Foundry Facings — Their Manufacture and Application," was most favorably received by the group, the subject being of general interest. Welcome was given by Mr. Fleig as vice chairman of the Northeastern Ohio Chapter.

*Federated Metals Div., A. S. & R. Co., and Secretary-Treasurer, St. Louis District Chapter.

The next speaker was W. H. Spencer of the Wilkening Manufacturing Co., Philadelphia. Mr. Spencer's subject was "Fluidity in General." As chairman of the fluidity committee of A.F.A. Mr. Spencer's experience, education and training made it possible for him to give a talk most favorably received by the group and to contribute materially toward a general round table discussion that followed.

Barringer Talks on Scrap Before Northeastern Ohio

By Edwin Bremer*, Cleveland, O.

NEARLY 150 members and guests attended the regular meeting of the Northeastern Ohio Chapter, A.F.A., which was held at the Cleveland club, Cleveland, on April 11. Chairman E. F. Hess presided. A coffee talk following the dinner took the form of an interesting, colored motion picture entitled, "Industrial Oddities," and was presented by Mr. Adams, Standard Oil Co. of Ohio.

The main speaker of the evening was E. C. Barringer, executive secretary, Institute of Scrap Iron and Steel, New York, whose topic was, "Scrap—Cinderella of Raw Materials." He pointed out that while the layman's conception of a scrap dealer was the typical junkman, that in reality scrap collection and handling was a major industry. During 1939 nearly 19,000,000 tons of iron and steel scrap were sold by dealers of which approximately 79 per cent was for domestic consumption. On the basis of $16 per ton, the value would be about $300,000,000 with one turn over. Usually scrap is turned over twice.

Largest sources of scrap are the railroads supplying around 1½ million tons, fabrication of iron and steel about 4 million tons, and scrap automobiles a little over 2½ million tons. Greatest consumers of iron and steel scrap are the open hearth furnaces which account for 70 per cent, foundries which use 20 per cent, and blast furnaces and other miscellaneous applications which employ 10 per cent. It is estimated that of the 7 million tons of scrap used by foundries that 6,300,000 tons are melted in cupolas, and the remainder in air, electric, and other furnaces.

In closing Mr. Barringer pointed out that of necessity buying, handling, and selling of scrap iron and steel involves considerable speculation. However, the scrap industry would like nothing better than steady, continuous purchase of scrap by consumers month in and month out which would eliminate the peaks of high prices and the valleys of low prices.

*Metallurgical Editor, *The Foundry*.

Cast Steel at Northern California

By Geo. L. Kennard*, San Francisco

THE April 12 meeting of the Northern California Chapter was held at the Alexander Hamilton Hotel, San Francisco, with Chapter Vice Chairman Ivan L. Johnson presiding. As a coffee talk feature, P. E. Geanque of the U. S. Treasury Dept. presented a discussion with a sound movie "Know Your Money," which all found extremely interesting and which this chapter recommends to all other A.F.A. chapters.

The technical feature of the evening brought a good attendance, especially from the steel group as John H. Spillane, Electro Metallurgical Sales Corp., reviewed the work done by Walter Crafts, John I. Egan and W. D. Forgeng of the Union Carbide & Carbon Research Laboratories on "Final Deoxidation of Cast Steel." This work as formally presented at the February meeting of the A.I.M.E. attracted a great deal of attention as explaining the formation of inclusions in steel castings.

Chairman Johnson read the report of the chapter nominating committee and gave a good account of the work of the membership committee in adding to the chapter roll.

*Secretary-Treasurer, Northern California Chapter.

MacKenzie Discusses Cupola Reaction at Birmingham

WITH 110 members at the meeting on March 15, the Birmingham Chapter heard Dr. James T. MacKenzie, American Cast Iron Pipe Co., discuss the chemical changes in cast iron in the cupola. W. O. McMahon, Sloss-Sheffield Steel & Iron Co. and chapter chairman, presided. He was assisted by J. E. Reynolds, U. S. Pipe & Foundry Co., Bessemer, Ala., as technical chairman. Dr. MacKenzie who is known internationally as one of the foremost metallurgists in the cast iron field gave an exceptionally interesting and informative discussion.

The April 19 meeting of the chapter was announced with Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va., talking on "Foundry Practice."

Michigan State Conference

(Continued from Page 11)

fected by Mold Materials." This paper also will be presented at the forthcoming A.F.A. convention. Following Mr. Dietert, H. Gould, Aluminum Corp. of America, Cleveland, Ohio, discussed "The Effect of Mold Materials on the Physical Properties of Cast Aluminum." This was an exceptionally interesting paper.

One point was notable throughout the entire conference and that was the free and open discussion which the papers presented brought forth. Repeatedly those present stated that this conference was the best that has ever been held both from the point of interest and from the amount of information brought forth. The conference ended with a luncheon in the Union Building at noon.

Annual Convention Program

(Concluded from Page 9)

Friday, May 10 (Continued)

10:00 A. M.—Steel Session
Chairman, F. A. Melmoth, Detroit Steel Castings Co., Detroit, Mich.
Co-Chairman, D. C. Zuege, Sivyer Steel Casting Co,. Milwaukee, Wis.
Application of Controlled Directional Solidification to Large Steel Castings, by J. A. Duma and S. W. Brinson, Norfolk Navy Yard, Norfolk, Va.

12:30 P. M.—Steel Division Round Table Luncheon
Chairman, A. H. Jameson, Malleable Iron Fittings Co., Branford, Conn.
Co-Chairman, John Howe Hall, Philadelphia, Pa.

2:00 P. M.—Gray Iron Session
Chairman, S. C. Massari, Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.
Co-Chairman, F. J. Walls, International Nickel Co., Detroit, Mich.
The Pearlitic Interval in Gray Cast Iron, by Alfred Boyles, Battelle Memorial Institute, Columbus, O.
Formation of Various Types of Graphite Patterns in Gray Cast Iron, by C. D'Amico, and R. Schneidewind, University of Michigan, Ann Arbor, Mich.
Report of Coke Specifications Proposal for ASTM, by B. P. Mulcahy, Citizens Gas & Coke Utility, Indianapolis, Ind.

3:30 P. M.—Foundry and Allied Industries Show Closes

PRESENT PAPERS AT CONVENTION

W. B. George

E. W. Williams

Westover on Job Evaluation at Quad City

By J. Morgan Johnson*, Moline, Ill.

SOME 100 members and guests were present at the April 15 meeting of the Quad City Chapter held at the LeClaire Hotel, Moline. Chapter Chairman, Herman Alex, Rock Island Arsenal, presided at the dinner and then presented H. Bornstein, Deere & Co., who introduced the speaker of the evening, C. E. Westover, Burnside Steel Foundry Co., Chicago, and chairman, Chicago Chapter. In his address Mr. Westover, speaking on "Job Evaluation and Time Study," told of his experiences in the foundry as compared to present methods, when they had to use their own ideas and plans individually as to the materials used and equipment desired without any definite system being followed in the shop. In comparison he showed the classifications of jobs and also of workers to do the various classes of work, and the evaluation study done to place in the classes A, B, C. Classes of workers and jobs were determined by the ability of the man and the skill he had on the jobs, with all factors and steps on any particular job being considered.

Slides were shown on various type jobs in the core room of the foundry that had been evaluated to determine price to pay for the work after a study of some 34,000 cases had been made. This talk proved very interesting to foundrymen and time study people alike, with many questions of great importance being asked.

Action was taken on recommended amendment to by-laws in regard to number of directors and years of serving for each of three groups.

The report of the nominating committee was made by Alex Matheson, chairman of the committee, as follows: Nathan Lesser, Deere & Co., *chairman*; A. H. Putnam, A. H. Putnam Co., Vice Chairman; J. Morgan Johnson, Moline, Ill., Secretary Treasurer; Directors—H. Bornstein, Deere & Co.; Frank W. Wells, J. I. Case Co., and F. O. Gorman, John Deere Spreader Works, for one year; P. T. Bancroft, E. C. Wussow, Williams-White & Co., and John H. Ploehn, French & Hecht, Inc., for two years; and A. E. Hageboeck, Frank Foundries, Inc., L. E. Roby, Jr., Peoria Malleable Casting Co., and Ray Wendland, International Harvester Co., for three years. These officers and directors will be voted on at the May meeting. Herman Alex was nominated to board of trustees for three years.

*Tri-City Mfrs. Assn. and Secretary-Treasurer, Quad City Chapter.

Philadelphia Holds Anniversary Meeting

By J. T. Fegley*, Philadelphia, Pa.

THE Philadelphia Chapter on April 12 had another fine turnout despite the bad hail and sleet storm that hit the city in the afternoon and continued throughout the night. One hundred and ten sat down to dinner and later retreated to a marvelous all-color, sound motion picture entitled "Canadian Rockies Holiday." Dr. G. H. Clamer, Ajax Metal Co., was invited to serve as technical chairman and as this was the 49th anniversary of the founding of the old Philadelphia Foundrymen's Association (April, 1891), several of the "old timers" were invited as guests. Those introduced in addition to Mr. Clamer were Messrs. Hopkins (Ajax Metal Co.), Thum (Palmyra Foundry Co.), Newcomb (Rogers Brown-Lavino Co.), Himmelright (Bethlehem Steel Co.), Bishop (Florence Pipe & Foundry Co.), Cop-

*North Bros. Mfg. Co. and Chairman, Chapter Publicity Committee.

page (Pusey & Jones Corp.). It is needless to say that they were given a big hand by the membership.

It was quite a coincidence that the speaker for this meeting, Wm. J. Shennan, now foundry consultant for Taggart & Co., was also the speaker at the first meeting of the Philadelphia Foundrymen's Association, forty-nine years ago, and he spoke on the same subject, "Foundry Practice." Mr. Shennan, who spent 60 years of his life in the foundry, is quite an authority on foundry operations, not only in this country but also abroad. He had no set paper but reminisced to the delight of the audience of the trials and errors encountered by foundrymen in the days gone by.

Mr. Shennan stressed good housekeeping as all-important for successful foundry operation. Cleanliness—proper location of cupola—tuyere size and location —proper lining and type of material for lining and patching cupola and ladles and various methods of charging were all discussed in the light of his varied experience in the Bethlehem Steel Co. foundries. It soon developed into a question and answer meeting and many interesting discussions brought out salient points that were of real interest and benefit to the members.

The chapter nominating committee then presented its recommendations for the coming year. Those named were: For *chairman*, R. J. Keeley, Ajax Metal Co. For *vice chairman*, John H. S. Spencer, H. W. Butterworth & Sons Co. For *secretary-treasurer*, W. B. Coleman, W. B. Coleman Co. For *directors:* D. J. Peake, Florence Pipe Foundry & Machine Co., and J. T. Fegley, North Bros. Mfg. Co. F. Kelly, Fort Pitt Malleable Iron Co., will succeed Mr. Heaslett as vice president, while C. H. Paul, Mackintosh-Hemphill Co., has been renominated for secretary-treasurer. Nominations for the executive committee include H. P. Spilker, Sterrit-Thomas Foundry Co.; T. A. Reynolds, McConway & Torley Corp.; H. M. Wilson, Taylor-Wilson Mfg. Co.; H. B. Reed, Westinghouse Air Brake Co., and C. I. Niedringhaus, Mesta Machine Co. The new officers will take over after the annual outing in June.

Details of the summer outing were announced by J. M. Stewart, chairman, entertainment and reception committee. The date has been set for June 10, at South Hills Country Club. It will be an all-day affair, featuring all types of sports and a buffet supper.

Pittsburgh Foundrymen's Association Discusses Electric Melting

By R. L. Hartford*, Pittsburgh, Pa.

ELECTRIC furnace construction, operation and use came in for considerable discussion at the April meeting of the Pittsburgh Foundrymen's Association. Principal speaker at the gathering, attended by 125 members and guests in the Fort Pitt Hotel, was Frank W. Brooke, Swindell-Dressler Corp., Pittsburgh, whose subject was "The Electric Furnace as Applied to the Melting of Steel and Iron." J. H. Johnston, Westinghouse Electric & Mfg. Co., and president, Pittsburgh Foundrymen's Association, presided.

Mr. Brooke discussed the application of electricity as a fuel in melting practice, pointing out its shortcomings as well as the inherent advantages obtainable through its use. Close control of temperature in the electric furnace does more than any other single factor towards producing a better metal and subsequently better castings. Recent developments have made the processes using electricity even more flexible than before, and improvements in equipment and technique in the charging operation have simplified the job to some extent.

With the aid of slides, Mr. Brooke illustrated the various steps from raw materials to molten metal via the electric furnace process.

As an added feature to tie in with this program, motion pictures demonstrating the manufacture of various types of refractory bricks were shown by the Harbison-Walker Refractories Co. Discussion leader for the evening was George H. Zoerb, Sharpsburg Foundry Co., Sharpsburg, Pa.

Annual report of the nominating committee, giving the slate of officers for 1940-41, was presented. R. C. Heaslett, Continental Roll & Steel Foundry Co., was named to the presidency, succeeding Mr. Johnston. Leo

*Penton Publishing Company.

BOOK NOTICES

Pattern Making, by J. Richey and revised by W. W. Monroe, C. W. Beese and P. R. Hall, 5½x8½, cloth cover, 233 pp., 350 illustrations, published by American Technical Society, Chicago. Price $2.00.

This book is obviously for the student and beginner. It discusses such subjects as the types of woods and metals used in pattern making, tools used in wood pattern making, measuring tools, machines and machine tools, the effect of molding practice on pattern design, various types of patterns.

Metallurgy, by C. G. Johnson, R. S. Dean and J. L. Gregg, 5½&x8½, cloth cover, 149 pp., 82 illustrations, published by American Technical Society, Chicago. Price $1.50.

This book appears to be a good one for the student and beginner in metallurgy. It seems to cover the salient points that the beginner should know, but because of the limited scope of the book, does not go into detail in many of the processes. This is a decided advantage to the beginner, as he does not become confused.

Gating and Pouring Temperatures in Non-Ferrous Foundry Practice

By J. Laing, Oldham, England

This paper, reprinted from the Foundry Trade Journal (London), Feb. 1, 1940, was an exchange paper of the Institute of British Foundryman and read before the Lancashire Branch of the I.B.F. It is reprinted here because of practical interest to members of the Non-Ferrous Division, A.F.A.

THE executive of a foundry producing both ferrous and non-ferrous castings can count himself fortunate if he has at his disposal skilled ironmolders with sufficient knowledge of brass foundry practice to enable them to be transferred to the non-ferrous foundry as the occasion arises. The greatest factor which operates against the successful transfer, and one which also largely operates against the success of an iron foundry foreman when set to make non-ferrous castings, is the lack of knowledge of the fundamental principles of gating, coupled with inexperience of the effects of pouring temperatures.

In bringing forward this subject, the writer hopes that he will stimulate the interest of the practical man, in other branches of the industry to that in which he is directly engaged, which in turn will do something to remedy the lack of versatility which does exist.

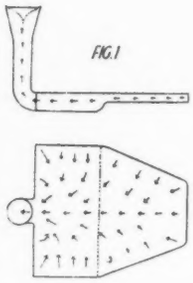
Gun Metals

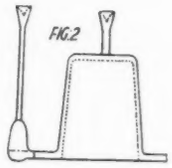
These alloys enter the tin-bronze group, the best known of which is Admiralty gun metal containing 88 per cent Cu, 10 per cent Sn, and 2 per cent Zn with small amounts of other elements. Although the compositions of gun metals vary widely, there being literally scores of different mixtures in use, the successful methods of gating a particular design in castings can be applied to almost all the alloys that are listed under this heading.

Broadly speaking, the points to bear in mind are so to design the gates as to allow the mold to fill rapidly with reasonable freedom from turbulence and at the same time maintain progressive solidification to the gates, from those points most remote from them.

The general rule with cast iron is to place the ingate or gates, as the case may be, so as to feed directly into the thinner or less massive parts and thereby level up, to some extent, the solidifying of the metal in the mold. In effect, the method acts in a twofold manner, hot metal flowing through the thin parts superheats the mold and, in consequence, arrives in the massive sections in a cooler condition, resulting thereby, to some extent, in a levelling-up of the solidifying range of the metal inside the mold.

With the gun metals, very little use can be made of this practice, mainly because, however well the gates are distributed, complete levelling up of the solidification is seldom, if ever, accomplished. The best successes are therefore achieved by reversing the procedure and feeding the hot metal directly into the mas-





sive sections as shown in Fig. 1. By this means, there results a superheating of the mold walls, which action is progressively diminishing in severity from the gate to the parts of the casting most remote from it.

Another very important point, which is the reverse of cast iron practice, is that it is essential, when dealing with gun metals, to place the vertical gate very close to the casting in order to reduce surface heat conductivity and ensure adequate feedings from the head. The theoretical line of solidification is illustrated by the arrows in Fig. 1. Runner cups or bushes are also differently constructed on small and medium work, and are made to form a funnel leading directly into the gate.

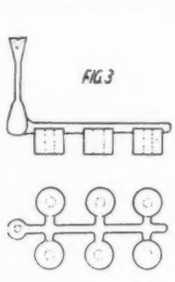
Although it is essential to use large runner gates, for commercial reasons they must not be unnecessarily large, as, besides increasing the melting costs (fuel and labor), they increase melting losses and, what is more important on high-class work, cause an unnecessary large percentage of gate scrap, with the consequent reduction in the value of the metal.

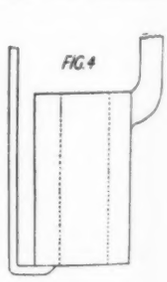
In Fig. 2 is illustrated diagrammatically a choke type of runner by which a considerable weight of metal can be saved while adequate feeding is maintained. Simply explained, it consists of a feeding knob, sufficiently massive to feed the casting, very similar, although larger, to the feeding knobs used in malleable iron practice. The desired shape can readily be formed by means of a suitable wood pattern preferably split on the dotted line, the two parts being held in position by a center dowel. When the pattern had been withdrawn, a comparatively small tube is pushed through the cope to form a downgate.

By following the method described, much cleaner casting conditions are obtained because the downgate can be more easily kept choked during the pouring operation. The method can also be applied to small castings molded in batches either by hand or machine, and Fig. 3 shows the method of application.

Top Gating

While top gating can be used successfully on small castings, or even on comparatively large, thin castings, it is not recommended for medium





and large work. When soundness or density of the metal is important, the pouring temperature has to be lower than will allow entrained air-bubbles to escape, with the result that air, or blow holes, are revealed on machining.

Risers

Although very great use is made of the runner gate for feeding pur-

poses in the non-ferrous foundry, there are many types of castings that have to be fed by means of risers. A common practice in the iron foundry is to use the top riser almost exclusively when its sole function is the providing of an adequate supply of feed metal. On the other hand, the brass foundry can generally obtain greater soundness by means of side risers, and Fig. 4 illustrates the application of a side riser to a heavy bush casting.

Although side risers of this type adequately provide for solidification shrinkage when correctly proportioned, should they be applied to important work designed to withstand hydraulic pressures, the pouring temperature must be carefully controlled, or a speckled, open grain will develop under the riser. This is caused by the massive riser prolonging the solidification unduly at that point and allowing the dissolved gases to fall out of solution. If, for any reason, the top feeder must be applied, it should be designed so as to ensure the prior solidification of the casting. It is also very essential that generous fillets be used at the junction of all gates, but they must not be made so large as to increase the mass at the point where the casting and gate connect, until it is in excess of the gate above.

Pouring Temperatures

The correct pouring temperature varies with the mass of the casting and the composition of the mixture. Very small, thin castings in Admiralty gun metal may be satisfactorily poured as high as 2336 or 2372° F. For heavy castings, 2102° F. will be sufficiently high. Very good mechanical tests are obtained when the test-bar is near the gate, and, provided the other conditions are correct, by using a pouring temperature of 2190° F.

For gun metals containing larger percentages of the low-melting-point additions, tin, zinc, or lead, the pouring temperature naturally decreases. The metal known in U.S.A. as red brass and containing 85 per cent copper, 5 per cent tin, 5 per cent zinc and 5 per cent lead should be poured between 2010 and 2190° F., depending on the size and mass. The alloy known as T.F.F.4, which is for all practical purposes 88 Cu, 10 Sn, 2 Zn, plus traces of phosphorus, has a pouring temperature about 108° F. lower than straight 88 Cu, 10 Sn, 2 Zn.

Rejects due to incorrect pouring temperatures are more numerous than is generally realized. They are usually much more serious when arising from too high a pouring temperature than are those due to cold-pouring. The latter will cause drawn areas at the junction of thick and thin sections and at the junction of runner and riser gates; small blow holes on upper sufaces, revealed after machining, and a tendency to show hair-line cracks along the crystal boundaries.

The effect of too high a pouring temperature is to cause inter-dendritic cavities. If the temperature be excessively high, it may result in very pronounced cavities being formed under the skin, which are only revealed on machining. More often it shows as a rough, speckled surface on the roughing cut, and as minute cavities on the finishing cut or polished surface. In some cases it may not even be visible to the naked eye, but will cause the casting to leak under pressure.

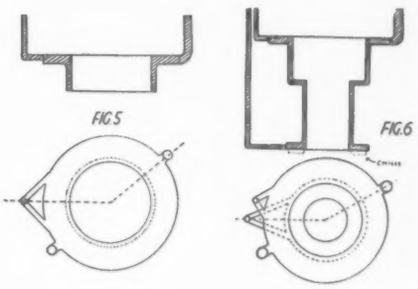
An examination of the fracture is an excellent guide as to whether the temperature has been too high. Correctly-cast gun metal has a dense, golden, crystalline structure. When cast too hot, the fracture may show a mixed blue, gold and red color, with the crystal structure scarcely, if at all, visible. Should such a fracture be examined under low-power magnification, it will show a network of inter-dendritic cavities closely connected one with another. Needless to say, metal in this condition always leaks on machined surfaces when subjected to pressure tests.

Phosphor Bronze

The extremely fluid character of the medium and high phosphor bronzes, together with their very wide solidifying range, calls for a somewhat different gating technique. It is usually advisable to run from, or at least near, the top of the mold, in order to assist progressive solidification from the bottom upwards. With large work, where the design may be such as to make top running impracticable, a series of gates will do much to prevent the formation of excessively hot regions in the lower parts of the job.

Fig. 5 illustrates a method of gating gland rings and similar castings. It will be seen that the runner gate follows much the same lines as would be used for cast iron. For a small ring, one feeding riser only is necessary, and should be placed near the runner so as to ensure it being filled with reasonably-hot metal. As the diameter increases, so must the number of feeding risers, one being sufficient up to about 10 in. in dia., two from 10 to 20 in., and three from 20 to 30 in.

Fig. 6 illustrates another type of fairly large casting which, owing to its particular shape, is not suitable for gating from the top. In this instance two downgates are employed, the first entering the bottom flange, and when the mold is almost full the plug is lifted off the second gate, allowing hot metal to enter into the



top flange. When gating in this manner, it is desirable to chill the face of the bottom flange heavily, to ensure it solidifying prior to the side walls. Heavy flow-off risers are employed to take care of the solidification shrinkage of the upper portion of the casting.

Excepting the very small work, it is preferable to use large runner bushes, such as are employed for cast iron, and almost to cover the gate with a piece of copper plate or strip, which will allow the bush to be filled almost instantaneously. Plugs can, of course, be used if desired, but, owing to the fluid nature of the metal, there is a tendency for them to leak, particularly when dry-sand runner bushes are used.

Pouring Temperatures

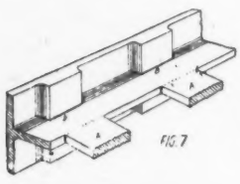
For important castings, the pouring temperature is more critical than that of any of the commonly used non-ferrous alloys. Examination of the fracture is an excellent guide as to whether or not the correct temperature has been used. When correctly cast, the fracture will show a dense structure, bluish-white in color in the thin section; the thicker ones will have a dense outer skin of similar color, the interior being golden with the crystal structure very clearly defined. With incorrect temperature, instead of a golden crystalline interior, there is a fracture showing mixed colors of bluish-grey, yellow and red, with the crystal boundaries invisible.

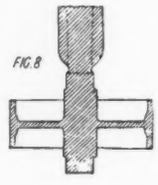
There are so many variable factors which govern the casting temperature of the phosphor-bronzes that no hard and fast rules can be established. The following figures will,

however, serve as a useful guide: Small and medium castings having wall thickness up to about ½ in. and poured in low phosphorus alloys, 1120 to 1150° C. (2048 to 2102° F.). For castings of similar size and mass, poured in high phosphorus alloys, 1070 to 1100° c. (1958 to 2012° F.). For wall thicknesses from ½ in. to 1 in., the requisite temperatures will be between 1090 and 1120° C. (1994 and 2048° F.) for the former alloys, and between 1025 and 1070 C. (1877 and 1958° F.) for the latter group.

Yellow Brass

Gating for yellow brass follows the practice indicated for the gun metals. It has, however, a greater solidification shrinkage and therefore requires larger feeders. Many yellow brass castings are of thin section and comparatively large in area, and on work of this character, a high pouring temperature must be used. For this reason, it is desirable on work of large surface area to skin-dry the





runner gates in order to prevent scabbing and erosion of the sand. The ingates should be well distributed and be placed to enter as near as possible into the heavier sections as illustrated at "AA" in Fig. 7, otherwise shrinkage cavities may occur at the points "BB."

Risers used to feed bosses, etc., should be enlarged almost down to the casting as shown in Fig. 8. It is sometimes difficult on small work of this nature, where several castings are made in one box, to accommodate an adequate number of risers and runner bushes. An alternative method, and one which often gives superior results, is to place separate direct runner gates on to each casting. The hot metal, passing through them, prolongs the solidification and promotes good feeding.

Pouring Temperatures

The pouring temperature of the brasses is not nearly so critical as is the case with tin bronzes. High percentages of zinc prevent the absorption of reducing gases during melting, thus the speckled gas-holed appearance, which often causes rejection of gunmetal castings, is entirely absent. The pyrometer is therefore not often used, although unnecessary high temperature causes greater zinc losses, increased liquid shrinkage, and an increased tendency to erode the mold, particularly in the runner gate.

Manganese Bronze

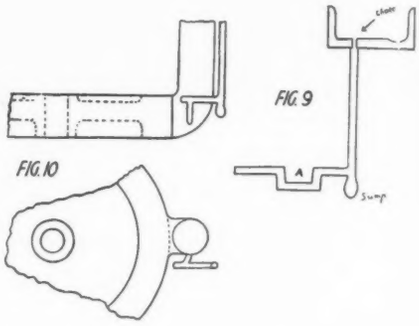
As quite a large number of nonferrous foundrymen fight shy of this metal there may be some excuse for the ferrous foundryman refusing to handle it. Successfully to cast the metal, a very highly developed gating technique is necessary. The alloy must enter the mold entirely free from turbulence and, furthermore, any oxide formed in the runner gate has to be prevented from passing into the casting, as, once oxide has been formed, it is never reduced or reabsorbed by the metal. The solidification shrinker is also extremely high and ample provision must be made for feeding, and for ensuring directional solidification towards the feeding heads.

Excepting for extremely thin work, very slow pouring should be adopted, as quick pouring will always tend to create turbulence. For the same reason the metal must enter from the bottom of the mold, or at least on the lowest level. Any cascading effect will certainly cause dross inclusions. It is a decided advantage to arrange, wherever possible, for the runner to enter immediately under a feeding riser so that the flow may be observed during casting and further, if small particles of dross are formed, they may be piloted up the riser by means of a mild steel rod.

The runner gates must also be so designed as to avoid any jet-like effect being given to the metal as it passes through them. When a number of gates are fed from a larger one, special attention should be given to surface friction which may cause an increase in the speed of the metal passing through the center of the small gates. Another important point when dealing with multi-gating is the prevention of an increase in pressure being given to metal in the small gates situated nearest to the main downgate. Dross traps and dross sumps are also used extensively on larger work, and such a trap is shown in Fig. 9. It is readily formed by bridging the gate with a core at "A." It is also very desirable slightly to choke the gate at the runner-bush end by means of a core as shown in Fig. 9.

Fig. 10 illustrates a method of gating that can be applied to small and medium shallow castings. Here the metal first enters the bottom of a feeding riser from which it flows very quietly into the mold.

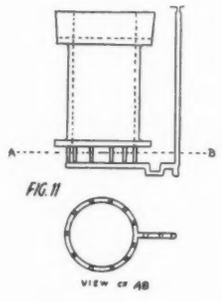
The most successful method of gating deep work is by means of a series of runners entering from below as shown in Fig. 11. The vertical runners increase slightly in cross-sectional area as they approach the casting. Gating a large casting

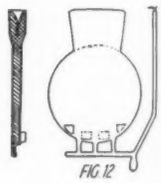


in this manner causes the metal in the lower flange to solidify later than the walls of the casting, with disastrous results, unless special precautions be taken to hasten the solidification. The method most readily applied is the placing of cast iron or copper chills on the base between the gates.

Pouring Temperatures

As with yellow brass, the density of manganese bronze is very little affected by pouring temperature. As, however, high temperature causes the shrinkage to increase, especially near the runner gates and near severe changes of section, and also





increases the dross-forming tendency, all castings should be poured as cool as possible, having due regard to the avoidance of mis-runs. About 1,000° C. (1832° F.) is a good average temperature which may be varied 50° C. (90° F.) or so in either direction, according to the size and mass of the casting.

Aluminum Bronze

The main problems to be met in casting the alloys under this heading are the prevention of oxide inclusions and drawn areas, problems which can only be solved by cor-

rect gating technique. The apparent solidification shrinkage is very high; therefore, large risers and feeding heads are essential. The latter may, in extreme cases, have to be considerably larger than the casting. As a general rule, the methods described for manganese bronze can be applied, but it is even more important not to allow disturbance of the metal surface as it fills the mold. The oxidized skin should lap gently to the sides as the metal quietly rises. On important work, the slightest ripple may be sufficient to cause rejection.

Disc-type work generally lends itself to casting on edge as shown in Fig. 12. Light chilling near the base, as illustrated by the dotted lines, will be a decided advantage as it will counteract the tendency to prolonged solidification due to the gates superheating the base of the mold.

Castings resembling the design shown in Fig. 13 are more suitable for casting on the flat, when a heavy feeding riser can be used to take care of the shrinkage in the boss. In all cases, where suitable arrangement can be made for feeding, greater soundness can usually be obtained in bosses and other heavy sections by leaving out the center core and casting such masses solid. Should coring be essential, chills may be resorted to.

A useful point to bear in mind when dealing with aluminum bronze and, indeed, with all the high-shrinkage alloys, is that hot metal poured into feeding heads and risers considerably improves their efficiency, but when applying the practice to the dross-forming alloys, the metal must be poured in with a very short stream, or oxide may be carried down into the casting.

Pouring Temperature

The average range of castings made in aluminum bronze can be poured between 1,170° and 1,200° C. (2,138° and 2,192° F.), but special massive ones may be poured considerably lower.

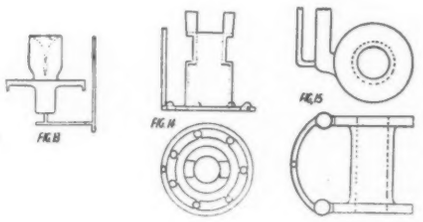
Aluminum Alloys

The commonly-cast aluminum alloys, especially the high silicon ones known as "Alpax," "Wilmill," etc., can be regarded as easy to cast by the average foundryman and call for no special comment. Into quite a different category enter the high-duty alloys, such as "Y"-alloy and their derivatives—R. R. 50, R. R. 53, Ceralumin, etc. All these alloys possess high solidification shrinkage and, due to their magnesium content, dross-forming tendencies.

Taken generally, it is desirable to use the multi-method of gating so as to avoid excessive overheating of one part of the mold, and to assist in levelling up the solidification. Bottom gating, because it reduces turbulence, is usually more successful. and pistons, liners, etc., can be cast with a continuous runner down the side of the mold, such as is used by die-casters. This type of runner also serves to supply hot feed metal to the upper part of the mold. A suggested method of multi-gating is given in Fig. 14. The feeding knobs, adjacent to the entrance of each ingate, are noteworthy. On deep work of a similar nature, it is often desirable to chill the base of the casting lightly in order to control the direction of solidification towards the feeders.

Pouring Temperatures

The aluminum alloys in general should be poured as low as possible consistent with obtaining a finished



casting free from cold-shuts and trapped air bubbles. About 700° C. (1,292° F.) is an average figure, which may be lowered to 670° C. (1,238° F.) for massive castings and raised to 780° C. (1,436° F.) or so for very thin ones. With high-silicon alloys, the actual pouring temperature is controlled to some extent by the modifying temperature which, when using metallic sodium, is standardized at about 760° C. (1,400° F.). Allowing a modification period of 2 minutes, a pouring range of 700° to 725° C. (1,292° to 1,337° F.) is usually obtained.

Very thin castings of comparatively large area may be found difficult to run completely within the range, and for this category it is often found desirable to modify at 20° or 30° C. (36° or 54° F.) above the recommended temperature. On very important work of a repetition character, one should obtain the correct temperature by trial in order to standardize it for future use—a procedure which should also be applied to almost all non-ferrous work of a similar character.

Nickel-Copper Alloys

While gating and pouring temperatures of high-nickel alloys are not the most important consideration in the successful production of good castings, they are, nevertheless, worthy of serious consideration if scrap is to be avoided. The difficulties involved are largely due to the extremely short solidification range, the fairly high solidification shrinkage, and the extremely high pouring temperatures.

The main consideration to bear in mind is the provision of adequate feeding gates. At the same time one should remember the difficulties involved in removing the heads and risers of the high-nickel alloy group by means of the ordinary dressing shop equipment, and design the gates accordingly.

A runner-gate, small enough to be kept choked and the metal entering through the risers, as is sometimes used in manganese bronze practice, gives the best results. Owing to the much shorter freezing range, the runner must, however, be considerably larger and very similar in size to that used in iron foundry practice. An example is given in Fig 15 which shows a short, double-flanged pipe. The runners passing through the heavy feeding risers ensure very hot metal rising up into them and, therefore, efficient feeding is assured.

Pouring Temperatures

Broadly speaking, one should pour as hot as possible, but, of course, stewing in the furnace in order to make sure of obtaining a high temperature is fatal. Owing to the very high temperature used, it is difficult to determine them satisfactorily, although they can, of course, be obtained by means of a protected thermo-couple, but the time lag is a drawback. The approximate casting temperature of the 70:30 Cu-Ni alloy is about 1,400° C. (2,252° F.) and the 30:70 Cu-Ni alloy (Monel metal type) is about 1,540° C. (2,804° F.). As a general rule, the more adequate the feeding, the wider is the pouring range.

Finally, a word of warning against the "Foundryman's" cure for porosity—increasing the height of the gates. This is usually described as "giving pressure," but unfortunately very often it does more harm than good. What is essential is the maintenance of a liquid passage of metal from the head to the casting until the latter has become solid, and this can usually only be accomplished by increasing the mass of the risers and bringing the head as near to the casting as possible.

ABSTRACTS

NOTE: The following references to articles dealing with the many phases of the foundry industry, have been prepared by the staff of *American Foundryman*, from current technical and trade publications.

When copies of the complete articles are desired, photostat copies may be obtained from the Engineering Societies Library, 29 W. 39th Street, New York, N. Y.

Alloys

MELTING. *"Melting Practice for Copper Alloys,"* by C. A. Timms, *Metal Industry* (London), vol. 41, No. 6, February 9, 1940, pp. 143-146. This is a survey of furnace equipment and operating conditions for melting copper alloys. The author gives a brief consideration to the theory of melting copper alloys, discusses the available melting equipment and then compares this equipment on the basis of melting costs. (A1.)

Bronze

DEOXIDIZER. *"Sodium Deoxidizer for Bronze," Canada's Foundry Journal,* vol. 13, No. 2, February, 1940, pp. 24-25. One of the greatest problems that the brass foundry man most over come is the keeping of oxygen out of his melted metal. Three compounds are discussed in this article as used for deoxidizing, washing soda, baking soda and common table salt. Washing soda makes an excellent flux for removing sulphur as well as oxygen from molten iron. In using salt nothing in it will injure the copper alloys, but it is not popular because the sodium melts and seperates the oxygen from the molten mass and the chlorine gases escape into the foundry. (A1.)

Cast Iron

ALLOY. *"Alloy Cast Iron in Railroad Equipment,"* by A. Reyburn, *Canadian Metals and Metallurgical Industries,* vol. 3, No. 2, February, 1940, pp. 52, 58. This is a review of the production of alloy cast irons manufactured by the foundry of the Canadian National Railway. The specification listed in the article has been used by this company for the last ten years with very good results. The author gives a few notes on their methods of cupola operation, such as bed coke, weight of charge, cupola blast and addition of alloys; then giving an explanation of their operation proceedure. (C.I.)

HEAT TREATMENT. *"The Heat Treatment of Cast Iron,"* by J. E. Hurst, *Pig Iron Rough Notes,* No. 79, 1940, pp. 5-11. One of the many outstanding developments in the metallurgy of cast iron which have occured during recent years is that of its heat treatment by hardening and tempering. Heat treatment is now practiced now in almost all foundries since it has been discovered it does not effect the mechanical properties. A great deal of research has been conducted by the author in obtaining knowledge of the influence of suitable tempering treatments applied to cast iron in the quench-hardened condition in restoring and even improving the mechanical strength properties. These data are results of tests conducted by the author giving improvements in hardening and tempering of cast iron. (C.I.)

WEAR. *"Wear of Diesel-Engine Cylinders and Rings,"* by Paul S. Lane, *Transactions A. S. M. E.,* vol. 62, No. 2, February, 1940, pp. 95-110. This paper deals chiefly with wear from the standpoint of cylinder and ring materials, rather than from the design or operating angle. The types of iron used, though very important factors, have received only a small amount of attention in published facts. This paper gives existing wear rates in medium and heavy-duty Diesel and gas engines in various fields of use, this is followed by a few examples of cylinder wear as affected by the hardness and structure of the iron alloy. The nature and characteristics of the materials used in cylinders and rings were surveyed through means of laboratory wear tests, along with service experience and covered the effects of section size, hardness, analysis and structure. Initial engine wear, as influenced by bore finishes and wear-resistant or chemical surface treatments, is also discussed, together with the action of bimetallic or composite rings, in retarding scuffing and over-all wear rates. (C.I.)

Centrifugal Castings

BRAKE DRUMS. *"Brake Drums Cast Centrifugally,"* by H. H. Fairfield and Maurice G. Eldred, *Canadian Metals and Metallurgical Industries,* vol. 3, No. 2, February, 1940, pp. 31-34. When the strength of steel is combined with the wear-resisting properties of a strong, hard iron an ideal brake drum is produced. By casting in a permanent mold, it is possible to obtain castings more uniform in size and balance than is possible in sand casting. Practically all the metal poured goes into the finished product; there is little waste in the form of gates, sprues and spillings. The work required in sand casting, such as sand preparation, molding, shake out and other necessary factors are eliminated by this method. Less floor space is needed for centrifugal casting. These ideas and others make it desirable to cast automotive brake drums by the centrifugal process, fusing an iron ring on to a steel plate. (C.)

Cleaning

METHODS. *"Metal Cleaning by Sand Blasting, Tumbling, Rolling and Burnishing,"* by C. C. Hermann and R. W. Mitchell, *Iron Age,* vol. 145, No. 10, March 7, 1940, pp. 54-57. This the twelfth in a series of articles on the technical and economic aspects of metal cleaning and finishing. Sand blasting, tumbling, rolling and burnishing are all discussed giving information on how each process is carried out, how the operation effects the surface metal, what the cost of each method is and machines and new methods employed by these processes.

Furnace

OPERATION. *"The Melting Process in the Foundry," Canada's Foundry Journal,* vol. 13, No. 2, February, 1940, pp. 12-13. This section of the article has to deal with good forms of cupola construction, "drying out" cupola lining and preheated blast. It is pointed out that in good cupola construction shelves of angle iron are provided to hold the lining at courses not over 3 feet apart. The integrity of the lining is thus maintained even if sections fall out from accidental causes. The drying out process is discussed and various processes of doing this operation are explained showing how each differs and its advantages and disadvantages. The subject of preheated blast for cupola melting is varied in the manner of application. However, there are two advantages pointed out: (1) to recover lost heat and utilize it effectively and (2) to overcome the handicap of cokes which are kept alight with difficulty. These advantages are then discussed in detail. (F.)

SULPHUR CONTROL. *"Control of Sulphur in Basic Open Hearth,"* by T. L. Joseph and F. W. Scott, *Iron Age,* vol. 144, no. 23, December 7, 1939, pp. 49-53. It has often been mentioned that non-metallic inclusions have an effect on physical properties of steel. This report gives quantitative data on the specific effects of such inclusions. This being the conclusion to the author's paper, information on factors affecting desulphurization in steel, relationship of sulphur in bath at melt-down and at tap, chemical equivalent of sulphur in open hearth and other points are related. (F.)

TRENDS. *"Trends in Electric Melting,"* by A. G. Robiette, *Metal Industry* (London), vol. 46, no. 3, January 19, 1940, pp. 43-48. During the past few years more than 50 different types of electric furnaces have been proposed and used for non-ferrous melting. Recently, steps have been taken towards standardization of such electric furnaces. This article indicates in which direction the standardization trend is going and how it is being accepted. There appears to be no consensus of opinion as to the most suitable type of furnace to be employed. (F.)

Heat Treatment

DECARBURIZATION. *"Surface Decarburization,"* by L. A. Danse, *Steel,* vol. 106, no. 6, February 5, 1940, pp. 60-61. Metallurgical laboratory research discloses that discrepancies between "apparent strength" and "effective strength" of fabricated steel automotive parts are caused by decarburized surface conditions. Surface stresses are high and the new automotive designs, in automotive manufacturing, involve considerable increase of stress and the service that the part undergoes is such that the maximum fiber stress is at the surface of a steel member. (H.T.)

INDUCTION METHOD. *"Induction Method of Surface Hardening,"* by Dr. H. B. Osborn, Jr., *Industrial Heating,* vol. 7, no. 1, January, 1940, pp. 26-30, 32. The application of induction heating to localized surface hardening has been one of the recent outstanding developments in heat treating. This process results in the production of locally hardened steel objects with the desired magnitude and depth of hardness, essential metallurgical structure of core, demarcation zone and hardened case, with no distortion or scale formation. A general review of the process is contained in this article, which explains this new development. (H.T.)

METHOD. *"The 'Austempering' Method of Heat Treating Steel," Industrial Heating,* vol. 7, no. 1, January, 1940, pp. 16-20, 22, 24. This new method of heat treating steel, known as Austempering, involves heating steel until it is substantially austentic and then quenching in a heat abstracting bath at a predetermined temperature and for a scientifically determined time. The result of this method is a steel comprised largely of bainite, the transformation product. These steels have a much greater degree of ductility and toughness than have steels treated by the ordinary quench and temper method. (H.T.)

Non-Ferrous

DEFECTS. *"Avoiding Defects in the Non-Ferrous Foundry,"* by N. K. B. Patch, *The Foundry,* vol. 68, no. 2, Febraury, 1940, pp. 29, 97-101. This is the third of a series of articles by the author dealing with the causes and of defects in non-ferrous castings, with suggestive corrective and remedial measures. In the preparation and finishing of cores, previous to installation in the molds, if they are not made with proper intelligence and experience, they may result in serious defects. This report is a review of defects caused by coreboxes, cores, sands, core wash and many other materials used. The author also deals with the defects that occur while pouring metal. (N.F.)

Pig Iron

MANUFACTURE. *"The Manufacture of Pig Iron in America,"* by William A. Haven, *Iron and Steel Institute,* pp. 1-43. This paper describes the manufacture of pig iron in America, giving designs equipment and practices which characterize nearly all American blast-furnaces. The chief pig iron producing districts are shown, data on the iron ores of the Lake Superior region are presented including chemical qualities, iron content, physical properties, output and so forth. Transportation of ores are illustrated showing distances and charges, storage facilities and other information. Great deal of attention is then given to blast-furnace plant and equipment and a detailed description is given covering such items as stock house bins, the lining and dimensions of blast furnaces, gas cleaning equipment and sintering and sintering plant. (F.)

Radiographic Inspection

ALUMINUM. *"Inspecting Aluminum Alloy Castings by X-rays,"* by A. E. Cartwright, *Canadian Metals and Metallurgical Industries,* vol. 3, no. 1, January, 1940, pp. 6-8. Development of the X-ray of castings in Canada has been due to the British Air Ministry, which, in turn enlisted the National Research Council to assist. This article gives a review of equipment and procedures used for the X-ray study and also gives information on casting checking technique. Defects most commonly sought after by the X-ray are blow holes, shrinkage cracks, pinholing, slag inclusions and sand or foreign metallic particles. The limitations of the X-ray examination is pointed out. (A.)

INSPECTION. *"Industrial Radiography,"* by Royal G. Tobey, *Iron Age,* vol. 145, No. 9, February 29, 1940, pp. 27-30. The important practice of X-ray inspection of metals is undergoing constant change and improvement. What the latest advances in equipment for industrial radiography are, technique of continuous and planar inspection, types of protection necessary and other important items relating to radiography are brought out in this article by the author. (T.)

Refractories

ALUMINA AND SILICA. *"Alumina and Silica Refractories,"* by Hobart M. Kraner, *The Iron Age,* vol. 145. no. 3, January 18, 1940, pp. 25-30. A description of the nature of alumina and silica refractories, methods of production, types of commercial material, and physical properties of the various grades is given by the author. The alumina-silica diagram and its significance is considered in relation to fire clay refractories, semi-silica bricks, manufacturing processes and properties. (R.)

ALUMINA AND SILICA. *"Alumina and Silica Refractories,"* by Hobart M. Kraner, *The Iron Age,* vol. 145, no. 4, January 25, 1940, pp. 34-39. The so-called acid refractories, made mostly from alumina and silica, find major use in the steel industry. The nature of these refractories, methods of manufacture and physical and thermal properties are all told in detail. This report is directed to methods of manufacture of commercial refractories; properties of silica brick, and aluminous refractories; and the nature of refractory tests. (R.)

Safety

ACCIDENT PREVENTION. *"Accident Prevention in the Foundry,"* by H. Mabson, *Canadian Metals and Metallurgical Industries,* vol. 3, No. 2, February, 1940, pp. 42-43, 56. This is a survey of the various injuries that occur in the foundry industry, it is not possible to go into many phases of accidents and their prevention in the foundries, but some of the major problems, their history and the solutions are discussed in this article. Such injuries as burns, eye injuries, injuries received while handling materials, and many others are outlined in this paper and then are shown how they could have been avoided or prevented. (Se.)

Sand

RECLAIMING SYSTEM. *"Molding Sand,"* by W. A. Phair, *Iron Age,* vol. 145, No. 10, March 7, 1940, pp. 48-52. At the Ansonia, Conn., foundry of Farrel-Birmingham Co., Inc., a new sand reclaiming plant has been built. This is a unique unit due to the fact that it is the first reclaiming plant built capable of handling both cement bonded and clay bonded sand. A schematic sketch is shown of the automatic system illustrating the workability of the unit. A step by step account of the sand reclaiming process is explained in detail by the author. (Sa.)

SYNTHETIC. *"Synthetic Molding Sand,"* by A. Tipper, *Foundry Trade Journal,* vol. 62, No. 1225, February 8, 1940, pp. 119-122. Synthetic molding has proved a practical success due to many factors that have proven advantageous to the foundryman when using it in his work. It costs less to maintain and no sand to dump, its improvement in permeability and lower moisture content means less chance of blown or porous castings and other defects experienced, it is easy to mold with lower moisture content (slower cooling) and gives higher production, it is then possible for semi-skilled labor to be used on machines with satisfactory results and it is possible to use old core or reclaimed floor sand for some types of work, such as steel. However, these are a few points that were brought out by the author, but he also gives disadvantages to offset the benefits derived from this sand. Choice of bond and moisture are discussed in detail. (S.)

May Chapter Meeting Schedule

May 10
Northern California
Alexander Hamilton Hotel,
San Francisco
A. LEE BENNETT,
Gladding McBean & Co.
"Refractories"

✦ ✦

May 13
Chicago
Chicago Towers Club
L. P. ROBINSON, Werner G. Smith Co.

✦ ✦

May 14
Northern Illinois-Southern Wisconsin
Hotel Hilton, Beloit, Wis.
C. O. THIEME, H. Kramer & Co.
"Non-Ferrous Foundry Practice"

✦ ✦

May 16
Birmingham District
Tutwiler Hotel
PROF. R. L. FARRABEE, University of Alabama
"Elements of Gray Iron Metallurgy"

May 16
Detroit
Fort Shelby Hotel
Quiz Program with Six Experts
Answering Questions

✦

Northeastern Ohio
Cleveland Club (Tudor Arms)
R. K. GLASS, Republic Steel Corp.
"Defects in Casting"

✦ ✦

May 17
Buffalo
Hotel Touraine
C. W. BRIGGS, Steel Founders'
Society of America
"Radiography"

✦

Wisconsin
Hotel Schroeder, Milwaukee
Old Timers' Night

✦ ✦

May 20
Quad City
Fort Armstrong Hotel, Rock Island
RAY WENDLAND, International
Harvester Co.
"Training in the Foundry"

✦

Pittsburgh Foundrymen's Association
Connelly Vocational School
I. A. BRINKMAN,
Hocintosh-Hemphill Co.
"Industrial Compensation Acts"

✦ ✦

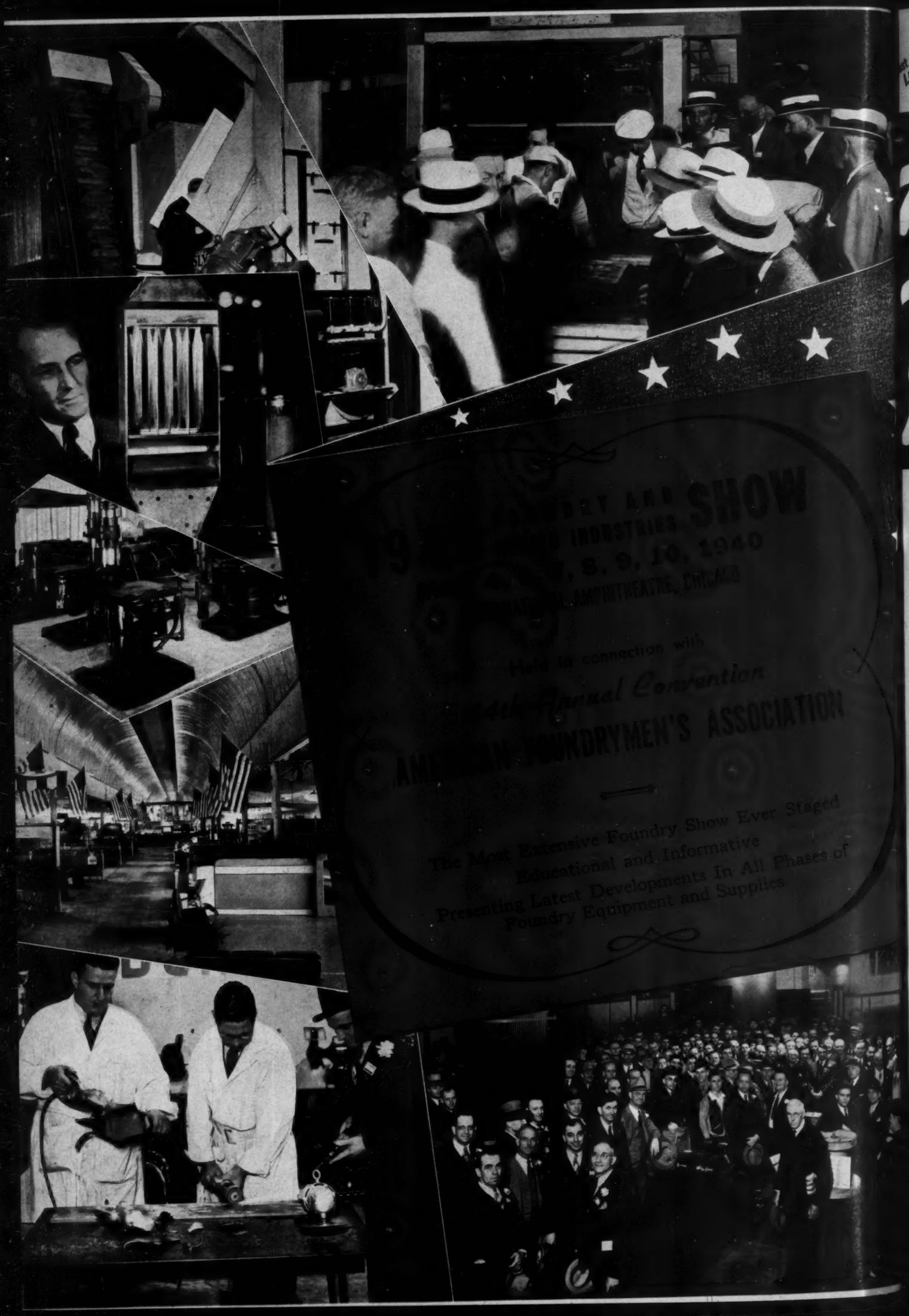
May 21
Cincinnati District
Gateway Restaurant, Union Terminal
W. M. BALL, JR., Edna Brass Mfg. Co.
"Non-Ferrous Alloys"

✦ ✦

May 23
St. Louis
York Hotel
D. P. FORBES, Gunite Foundries Corp.
"Cost Plus Profit Equals Price"

✦ ✦

May 24
Central New York
Hotel Onondaga, Syracuse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